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- Cranbury Twp Land Use Plan

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CRANBURY TOWNSHIP LAND USE PLAN
AND AGRICULTURAL CONSERVATION ELEMENT

Prepared By:

CRANBURY TOWNSHIP PLANNING BOARD

With the Technical Assistance of:

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PRINCETON, NEW JERSEY TARRYTOWN, NEW YORK

Adopted: September 9, 1982

ACKNOWLEDGEMENTS

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MIDDLESEX COUNTY, NEW JERSEY

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In addition, without listing names, acknowledgement is made of assistance from outside agencies, Township residents, and individuals in the local agricultural community.

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I. INTRODUCTION

A. General

In planning for its future Cranbury Township must deal with such complex development and environmental issues as agricultural conservation, environmental management, historic preservation, housing and employment balance and the affordability of housing, legal planning mandates, and the threat to the community's rural life style of continued intensive development in nearby parts of the region.

The purpose of this report is to summarize the results of various planning analyses that were undertaken to assist the Township in making the soundest possible decisions about its future. It also provides the base data it needs to bring its existing Land Use Plan Element into compliance with New Jersey's Municipal Land Use Law. Following its adoption by the Planning Board, the revised Land Use Plan will be forwarded to the Township Committee to serve as a basis for the updating of zoning and site plan review ordinances and their integration into a comprehensive land development ordinance.

B. Report Organization

The planning process used in developing the revised Land Use Plan involves three phases of study.

The first phase summarizes the existing conditions in the region of which Cranbury is a part and the regional governmental policies that affect the Township. It includes a review of relevant state and county plans, population and job projections, transportation policies, agricultural policies, an analysis of existing land use patterns and trends and a review of long range development objectives. The land use plans and policies of adjacent municipalities were also reviewed to identify any major existing or potential areas of incompatibility.

The second phase analyzes relevant factors within Cranbury Township. These include an evaluation of its existing land use pattern and its development potential under existing zoning; environmental factors; circulation; the historic district; and the present and potential adequacy of the Township's water and sewer systems. The findings from these studies, with

particular attention to the Township's agricultural base and housing needs, lead to the identification of key planning issues. The techniques used in New Jersey and elsewhere to preserve agricultural lands are presented in some detail, given the importance to the Township of its agricultural base.

The third phase of the planning program centers on the formulation of goals and policies to guide the development of the land use plan and other master plan elements.

Throughout the planning program open workshop sessions were held by the Planning Board to discuss the findings of completed studies and to formulate policies on future development. At all times, the public was given full opportunity for comment.

II. BACKGROUND -- PREFACE TO PLANNING

II. BACKGROUND - PLANNING INFORMATION

A. Regional Overview

1. General

In order to coordinate Cranbury's planning efforts with those of county and state agencies in the context of currently prevailing areawide trends, a review of past studies, adopted plans, and on-going planning efforts was undertaken. The results of this review are set forth below.

2. State Development Guide Plan

The State Development Guide Plan was designed to provide a long-range, statewide perspective in the formulation of state, county and local development policies. This plan also acts as an investment guide for public improvements and is used by municipalities as a growth management tool.

Of the several land use and development intensity designations in that plan the following five are present in Middlesex County: Growth Areas, Limited Growth Areas, Agricultural Areas, Conservation Areas, and Urban Aid Municipalities. In Cranbury Township, the lands located west of Old Hightstown Road, Main Street, and the Village are designated as an Agricultural Area, and the remainder of the Township is designated as a Growth Area.

The New Jersey Department of Community Affairs designates as "Agricultural" only areas with the following characteristics:

- generally low-density or sparse development
- relatively poor accessibility to existing commuter rail and major highway facilities
- the presence of large blocks of land classified as prime agricultural soils by the Soil Conservation Service
- accessibility to rural centers, agricultural support services and markets

- lack of extensive sewer and water systems
- large blocks of contiguous land where fertilizers and insecticides can be safely applied*

According to the Development Guide Plan, it is the intent of the State that all designated Agricultural Areas have priority for all state farmer assistance programs.

Growth Areas were delineated if they possessed the following characteristics:

- location within or adjacent to major population or employment centers
- location within or in proximity to existing major water supply and sewer service areas
- location within or in proximity to areas served by major highway and commuter rail facilities
- absence of large blocks of public open space or environmentally-sensitive lands
- absence of large concentrations of agricultural land**

In essence, Growth Ares were designated to either accommodate a continuation of existing development, or to encompass lands that are logically suited for future development.

3. Middlesex County Master Plan

In 1979, Middlesex County issued a draft Master Plan which sets forth population and employment levels and land use distributions expected to materialize by the year 2000 in accordance with certain recommended land use goals and policies. The County Master Plan is designed to provide a regional context for municipal master plans so that, in the aggregate, growth and conservation

*State Development Guide Plan, Revised Draft, New Jersey Department of Community Affairs, May 1980, pp. 47 and 46.

**State Development Guide Plan, Revised Draft, New Jersey Department of Community Affairs, May 1980, pp. 47 and 69.

needs will be balanced, available public funds will be allocated in a responsive and cost-effective manner, and county-wide housing needs will be capable of being satisfied in an efficient and equitable manner.

The County plan was developed in conformity with the State Development Guide Plan as well as with the plans and guides of the Tri-State Regional Planning Commission and the Middlesex County Housing and Development Committee, 208 Policy Advisory Committee, and Transportation Coordinating Committee.

To accommodate the growth projected for the year 2000, the Plan provides an additional 16,000 acres of land for housing, an additional 15,000 acres of land for economic development, and an additional 7,000 acres of land for parks and recreation. Full development of the county is not anticipated until well past the year 2000.

The Land Use Plan element of the overall County Plan establishes a variety of land use categories based upon projected growth and includes the following designations: Residential; Non-Residential; Open Space/Conservation; Agriculture; Undeveloped; Major Institutions; and Proposed Planned Unit Development. The major spurs to development in southern Middlesex County are Routes 130 and 1 and Exit 8A on the New Jersey Turnpike. Along Route 1, development pressures originate from the Trenton area in the south, while along Route 130 development pressures originate in the north. Another source of pressure on Cranbury Township from the north is the New Jersey Turnpike Exit 8A.

Within Cranbury Township, the County Plan establishes five land use categories: Residential; Non-Residential; Open Space/Conservation; Agriculture; and Undeveloped. The land proposed for residential development is generally located north and south of the Village, along Old Trenton Road (existing development), and along the east side of Route 130 between Brainerd Lake and Half Acre Road. Non-residential uses (commercial, office, and industrial) are proposed to be limited primarily to existing development. By the year

2000, the plan expects that non-residential development will intensify in the Route 130 corridor and in the vicinity of Exit 8A on the New Jersey Turnpike in adjoining South Brunswick and Monroe Townships, but not in Cranbury.

Most of the land proposed for agricultural use is located west of the Village. This area is part of a broad, 10,000-acre regional agricultural corridor located between Routes 130 and 1 in Plainsboro, Cranbury and South Brunswick Townships. Substantial areas east of Route 130 are also proposed to remain in agricultural use.

The "undeveloped" land designation is limited to the southeasterly portion of the Township in recognition of the poor soil conditions that prevail there. The Open Space/Conservation classification is applied along stream corridors.

The County Plan also deals with other concerns and policies, the more relevant ones of which are summarized below.

(a) Housing

- Since public monies are not available for sewers, roads, and services for scattered development, future housing should be located near existing development.

- Studies by the Tri-State Planning Commission indicate that municipal costs rise disproportionately between densities of two units per net acre to two acres per unit, which is the point where on-site water and sewer facilities become feasible. For this reason, new residential development at densities of between 0.5 and 2 dwelling units per acre should be discouraged.

- Since widely scattered housing and employment requires large public investments in new road construction or improvements, work trips should be shortened by locating residential development in proper relation to centers of employment.

(b) Historic Preservation

- Historic sites, and especially those which are on the National Register of Historic Places, should be protected from development that threaten their integrity and could thus damage their value as cultural resources.

(c) Economic

- While only 15,000 acres of the land which is vacant at present will be needed for economic development by the year 2000, a much larger area which is not equipped with the necessary water, sewer, and roadways is now zoned for industrial uses. In addition, much of the land now zoned in industrial classifications is remote from planned residential areas thereby increasing the home to work trips.

(d) Agriculture

- The development needs anticipated between now and the year 2000 can be accommodated without affecting most of the county's 30,000 acres which are now in agricultural use. For this reason, development on actively farmed prime farmland should be minimized, as should the location of land uses that would be incompatible with the continued agricultural use of such lands.

4. Adjoining Municipalities

In addition to achieving compatibility with the larger regional framework, it is desirable that local plans also take into consideration those of adjoining municipalities. By reviewing their existing land use patterns and policies, Cranbury can seek to achieve compatibility of land uses across municipal boundaries--using buffer or transitional areas where needed--determine appropriate zone boundaries, and identify any environmental concerns that may need to be addressed on an intergovernmental level.

(a) South Brunswick

The area north of Dey Road is zoned A-3, Rural Agricultural, requiring a minimum of three acres of land per dwelling unit. The area is now in agricultural uses which include orchards; some of this land is wet.

Along both sides of Route 130 as far east as the boundary of Monroe Township is an I-3, General Industrial Zone which permits such uses as offices; lumber, coal, fuel and general storage yards; manufacturing, including chemical production; and a variety of other intensive uses. Cranbury's existing industrial zone is compatible with the adjacent South Brunswick industrial zone.

(b) Monroe Township

In Monroe Township, the land bordering on Cranbury is primarily in a Light Impact Industrial zone which permits office development, enclosed warehousing, business-professional offices, and similar activities. The industrial uses permitted in Monroe Township are less intensive than those permitted in South Brunswick. The industrially zoned lands in Monroe Township are still in agricultural use as are the lands to the east thereof. The latter are mapped in an agricultural zoning district which requires minimum lot areas of three acres.

(c) East Windsor Township

The boundary between Cranbury and East Windsor Township is defined by the Millstone River. The low lands and treed areas adjoining that waterway act as an effective buffer between the two communities. East of the New Jersey Turnpike beyond the Cranbury Township limits is located the Twin Rivers PUD and land zoned I-O, Industrial Office. Between the Turnpike and Edinburgh Road (Old Trenton Road) the land is zoned in several residential classifications (R-1 to R-4) with zoning densities ranging from two to 16 dwelling units per acre. Between Millstone Road and the West Windsor boundary the land in East

Windsor is owned by the Township and, while it is zoned Agricultural, at one dwelling unit per two acres, it is in fact used by the East Windsor Utility Authority for spray irrigation.

(d) Plainsboro Township

Land adjacent to Cranbury between the Millstone River and Cedar Brook is zoned R-100, Agricultural, at one dwelling unit per acre. The township is currently investigating the feasibility of using the Transfer of Development Credits (TDC) technique to preserve this land for agriculture.

Land in Plainsboro adjacent to Cedar Brook and Petty Road, which is zoned for Planned Development, is being developed by the Linpro Company for a variety of town house and multi-family residential uses. Within the Linpro project an open space buffer along Cedar Brook will protect the future homes from flooding and from any effect of continued agricultural use of lands in Cranbury Township. This will also tend to protect Cranbury's agricultural land from the proximity of intensive residential settlements.

5. 201 Facilities Plan and Monroe Township Utility Authority

The Upper Millstone 201 facilities study* developed a regional wastewater management plan for those portions of Hightstown Borough and Cranbury, East Windsor, Millstone, and Monroe Townships which lie within the Millstone River basin. The goal of the study was to provide guidelines for the systematic development of a sewer system that will realistically meet the region's growth expectations while protecting the natural environment. A summary of the 201 Plan recommendations for Cranbury Township follows:

- The existing village sewerage system should be used to capacity.

*201 Facilities Plan, Upper Millstone River Basin, Upper Millstone Water Management Study Group, December 1978.

- On-site septic systems should be incorporated into a septage management district.

- All sewage other than that generated in the village should be served by a treatment plant within the Upper Millstone River Basin.

The Monroe Township Utility Authority has explored the engineering feasibility of expanding its water and sewer lines to service the New Jersey Turnpike Service Area and General Foods. A twelve inch water line could follow Prospect Plains Road and South River Road and connect with a ten inch water line at Forsgate Country Club, forming a loop. The potential sewer system would consist of a forced main from the Turnpike Service Area to Monroe Township. As proposed, the pumping station would have a capacity of 200,000 gallons per day with the existing development using 80,000 to 100,000 gallons per day; under this proposal, Cranbury would be allocated a capacity of approximately 100,000 gallons per day for additional development. In addition, since the Authority is now using only 25 percent of its three million gallons per day treatment capacity, additional service can be provided to Cranbury, among others. In order for the plant to realize its full capacity, however, any effluent discharge above a 1.5 million gallons per day level may need upgrading and, if so, this may be very costly depending on DEP regulations. The present system produces effluent water which approaches potability.

The Monroe Township Utility Authority is careful to note that any service above the initial 100,000 gallons per day level would require the Township to expand the franchise which it now holds in Cranbury.

6. Summary of Cranbury's Regional Planning Framework

Based on the above, the major regional factors that affect Cranbury Township seem to be the following:

- As applied to Cranbury, regional planning policies would direct growth toward the Route 130--New Jersey Turnpike corridor while preserving the land located generally west of the Village for agriculture.

- According to County projections, Cranbury will have to accommodate some 2,600 additional residents by the year 2000, with very little demand for industrial, office, or commercial development.

- Existing and proposed land use policies in adjoining municipalities are generally consistent with regional policies.

  - Given the strong natural boundaries that separate Cranbury's land uses from those in East Windsor and in that segment of Plainsboro that includes the Linpro Company project, the preservation of agricultural uses in adjoining areas in Cranbury would have no adverse effect on the neighboring communities' residential development.

  - The existing character of the lands in Cranbury is very similar to that of adjoining lands in Plainsboro along George Davidson Road and John White Road and of those in South Brunswick north of Dey Road. It is therefore in the interest of all three townships that plans for the future use of lands along theit municipal boundaries be closely coordinated. The lands in the adjoining communities are mapped in agricultural zones with densities of one unit per acre in Plainsboro and one unit per three acres in South Brunswick. The agricultural use of the Plainsboro lands may soon be preserved in perpetuity by use of the Transfer of Development Credits technique.

  - In South Brunswick, the lands along Route 130 are zoned for intensive industrial use to take advantage of their accessibility. Existing uses include scattered warehouse and industrial operations and the existing zoning permits even more intensive uses in the area. For this reason, the use of adjoining lands in Cranbury for residential purposes would be inappropriate.

- The zoning for light impact industrial uses of lands in Monroe Township adjoining Cranbury is quite compatible with Cranbury's existing office-research development zone. The zoning in both municipalities enables lands adjoining the New Jersey Turnpike to take advantage of the advertising exposure which this gives them.

- Three of the four townships have agricultural zones requiring minimum lot areas ranging from two to three acres per dwelling; Plainsboro, where the agricultural lands that are now being considered for preservation are zoned for one acre lots, is studying the possibility of enacting a more permanent agricultural lands preservation program.

B. Township Planning Framework

A review of local conditions and trends was undertaken to help the Township evaluate available alternative future land use options. This review will assist in determining the extent and type of community needs and opportunities in the areas of housing, employment, agricultural preservation, water and sewer facilities, and other public support services. This analysis also highlights recent changes, areas where change is likely to occur, and areas where undesirable change can only be prevented by public initiatives.

1. Demographic and Housing Profile

Middlesex County has experienced continuous growth since 1940. In the decade of the 1970s its population grew by 96 percent, from 584,000 to 596,000. The county presently estimates that, by the year 2000, the population will reach 830,200, thus adding as much as 39 percent to its 1980 population. The county's ability to attract development at this scale is attributable to its central location in the state and its accessibility, both of which enhance its attractiveness for office and industrial uses. These projections are now being re-evaluated in the light of the complete 1980 Census data, and the County expects that they will be revised downward for the county as a whole.

Of the four municipalities which comprise southern Middlesex County, (Plainsboro, South Brunswick, Monroe and Cranbury Townships), Cranbury is developing at the slowest rate. In contrast to countywide trends, Cranbury's population has declined by over 14 percent in the 1970-1980 decade, from 2,253 to 1,927. This decline occurred in spite of an increase in dwelling units from 694 in 1970 to 739 in 1980. This had the effect of reducing the number of residents per dwelling unit from 3.2 in 1970 to 2.6 in 1980. The reasons for this drop in population per household, which include fewer children, postponed marriages, a greater divorce rate, etc., apply throughout the nation.

The county's population projections for Cranbury imply a reversal of the 1970-1980 trends, with increases to 3,400 in 1990 and 4,600 by the year 2000. If the population per dwelling unit will remain constant at 2.5 persons, Cranbury's 739 dwelling units in 1980 should increase by about 620 units to 1,360 in 1990, and to a total of 1,840 by the year 2000. The township's present rate of development is approximately 20 units per year. The county projections, which start from what now appears to have been an erroneous 1980 base, will be reevaluated when the full results of the 1980 Census become available. If these projections are confirmed, under the Township's present residential zoning which requires one acre per dwelling unit over most of the Township's developable land, the 1,100 units required by the year 2000 would use 1,500 or more acres of land. If this development were to be permitted to occur randomly throughout the Township's prime farmland area, the chances of survival of agriculture within its boundaries would be almost nil.

2. Employment

According to an October 30, 1980 survey undertaken by the Township, the number of people employed in Cranbury was 2,238. Approximately 90 of these jobs (exclusive of seasonal workers) are directly related to the agricultural industry. Office-research use was the major employer accounting for 70 percent of the work force. On a countywide basis, employment has been relatively stable.

3. Historic Identity

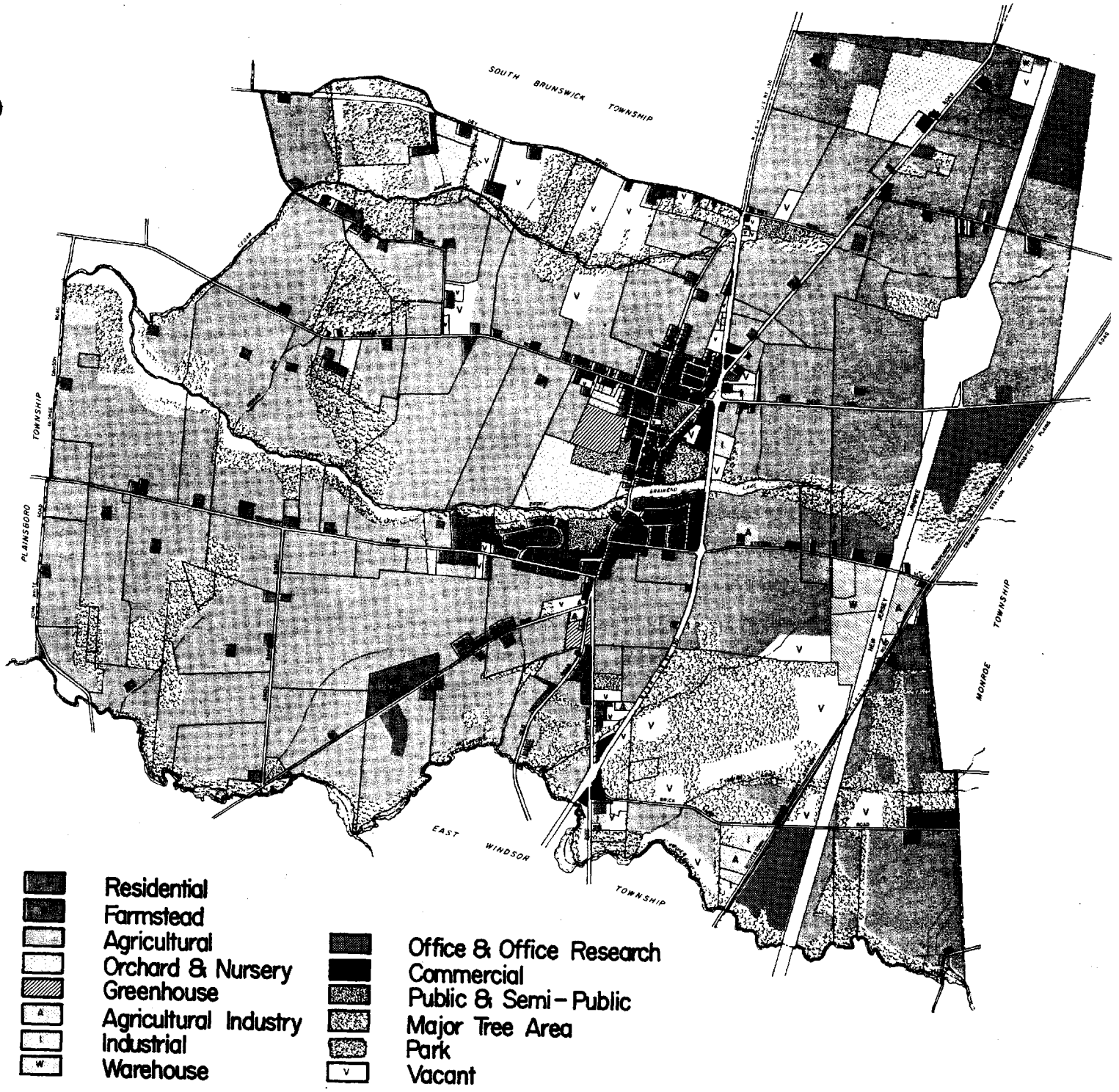
Cranbury Township's Village area was placed on the National Register of Historic Places as a Historic District on September 18, 1980. The District contains 218 buildings that were built mainly between 1840 and 1880. Nomination and placement on the Register was earned because of the profusion of examples of the Greek Revival, Italianate, Carpenter Gothic, Queen Anne, and Colonial Revival architectural styles that are present in the area.

The Middlesex County Inventory of Historic, Cultural, and Architectural Resources which was prepared between 1977 and 1979 recommends that the agricultural land on Cranbury Neck Road be added to the Village Historic District because its unusual farm homes and barns are unlike those found in Plainsboro and other rural areas in the county. They are described by the Inventory as "essential to understanding the historical development of the agricultural region."

From the historical preservation viewpoint, two major areas of concern are maintaining the District's architectural quality and protecting its integrity from the destructive effects of heavy traffic and from development on the Village periphery which would destroy its historic setting. The Cranbury Historical Society recommended that the feasibility of agricultural preservation be evaluated as one means of safeguarding the District.

4. Existing Land Use

Cranbury Township's existing land use was analyzed on the basis of a lot by lot field inspection of the entire Township, a review of aerial photographs and tax maps, and interpretation of remote parcels by the township engineer. Plate II-1, "Existing Land Use" and Table II-1, "Existing Land Use" summarize the results. Also, Table II-2, "Existing Land Use Distribution by Geographic Areas" tabulates land uses by major areas in the township. The "West of Village" area in Table II-2 includes all land lying west of Route 130 between the East Windsor boundary and Hightstown Road; west of Hightstown Road and Main Street



Existing Land Use

Plate II - 1

CRANBURY TOWNSHIP

MIDDLESEX COUNTY, NEW JERSEY

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between Route 130 and the Cranbury Elementary School; all land owned by the Board of Education and the Wright's Roses nursery; west of Prospect Street and Big Barn Road; and the area west of Main Street between Barclay Street and Route 130. The lands "East of Village" include everything east of Route 130. The "Village" classification includes all remaining land.

Plate II-1, which shows the Township's land use pattern by major uses clearly demonstrates that Cranbury is now a predominantly agricultural community.

Table II-1

EXISTING LAND USE, CRANBURY TOWNSHIP
February 1982

Use	Acres	Percent
Residential	650	8
Farmsteads	60	1
Agricultural	5,030	59
Orchard, Nursery	145	2
Greenhouses	200	2
Agricultural Industry	50	1
Office and Office Research	250	2
Industrial	30	--
Warehouse	70	1
Commercial	35	--
Public and Semi-Public	60	1
Major Wooded Areas	1,440	17
Vacant	260	3
Park	20	--
Water	160	2
TOTAL	8,460	100

Source: RPPW.

Table II-2

EXISTING LAND USE DISTRIBUTION BY GEOGRAPHIC AREAS
Cranbury Township, February 1982 (acres)

Use	Total Acres	West of Village Acres	% of Total	Village Total	% of Total	East of Village Acres	% of Total
Residential	650	400	9	160	38	90	3
Farmstead	60	40	1	--	0	20	1
Agricultural	5,030	2,800	62	140	33	2,090	58
Orchard and Nursery	145	30	1	5	1	110	3
Greenhouse	200	200	4	--	0	--	0
Agricultural Industry	50	10	--	--	0	40	1
Office and Office Research	250	--	0	--	0	250	7
Industrial	30	--	0	--	0	30	1
Warehouse	70	--	0	--	0	70	2
Commercial	35	--	0	15	3	20	1
Public and Semi-public	60	40	1	20	5	--	0
Major Wooded Area	1,440	800	18	40	10	600	6
Vacant	260	80	2	--	0	180	5
Park	20	--	0	20	5	20	1
Water	160	90	2	20	5	50	1
Total	8,460	4,490	100	420	100	3,550	100

As shown in Table II-1, agriculture or crop lands occupy 5,030 acres or 59 percent of the township's total area of 8,460 acres. If orchards and nurseries, and the agricultural industry are included, the percentage rises to 64. The other uses include residential, at 8 percent, and office and office research, at 3 percent. Office-research uses are located along the New Jersey Turnpike, and the newest residential subdivisions are located along Old Trenton Road. The wooded area and vacant land classifications, which cover 20 percent of the total area of the Township, include areas that are largely undevelopable for either agriculture or suburban development.

Table II-2 which shows that there are 710 more acres in agricultural use west of Route 130 than there are east of Route 130, and that all the office, research, and industrial uses are located east of the Village. The 90 acres of residential land located east of the Village include some

large lots, several "farmettes," and a few older homes.

5. Existing Zoning

Cranbury Township has six zoning districts regulating the use of its land: the R-170 zone, which essentially limits uses to single family homes on one acre lots, is mapped primarily in the agricultural area west of the Village; the R-100 zone, permitting both one and two-family homes on 15,000 square foot lots in an area commonly known as the Village; a Neighborhood Business Zone, which is intended for commercial and business uses, is located in the center of the Village; a Highway Commercial zone, permitting commercial uses associated with Route 130; an Office Research zone, which provides for modern office buildings and high technology research establishments, is located along South River Road and in the triangle formed by Route 130, Dey Road, and South River Road; and the Industrial Zone, which permits all types of industries exclusive of any hazardous uses. The latter district covers all the land east of Route 130 except for that which is zoned Office Research and Highway Commercial.

In past years, the one acre minimum lot requirement of the R-170 zone was sufficient to protect agricultural uses from intrusion by single family homes; such residential growth as was experienced in the Township was absorbed in the R-100 zone where the permitted density is three dwelling units per acre. In recent years, however, the Cranbury area has gradually become a part of the outer commuter belt in addition to experiencing the pressures emanating from the ever-spreading employment centers in the New York-Philadelphia corridor. As a result, some of the lands zoned R-170 have been, or are in the process of being developed with standard suburban subdivisions such as Shadow Oaks I and II.

Almost all the land in the two zoning districts, R-100 and Neighborhood Commercial, in the Village is developed. The primary zoning concern in this area is the integrity and preservation of the Village Historic District, including its agricultural setting.

The Highway Commercial Zone, located along Route 130, includes only a few, relatively minor vacant land parcels in addition to existing commercial uses. Recently, the Cranbury Township Environmental Commission asked that highway commercial uses be restricted to prevent haphazard strip development and the damage which might be inflicted on businesses in the Village by competing establishments along the highway. The preservation of the Historic District as a vital component of the Township is very dependent upon the continued vitality of its businesses.

The Office Research zone was adopted quite recently in an effort to capture for the Township some of the development opportunities generated by the changing market. This district has been mapped in a limited area along South River Road. The Industrial Zone, which is designed to accommodate most types of nonresidential development, is still mostly in agricultural use or vacant. The extent of the areas zoned for major employment centers in Cranbury is so great, however, that, were it to be completely developed with offices and manufacturing plants, it would generate irresistible pressures for change on the rest of the Township, and would thus jeopardize its chances of preserving either agricultural or its historic heritage.

6. Environmental Analysis

A review of Cranbury's soil and floodplains was undertaken to identify areas suitable for agriculture and development preparatory to the formulation of a conservation and development policy.

(a) Soils

The U.S. Department of Agriculture (USDA) has conducted an interim soil survey for Middlesex County as part of the National Cooperative Soil Survey Program in 1978. A 1980 updating of the USDA report did not affect the soil types or the boundaries between them in Cranbury Township. In addition to soil types the survey reviewed suitability of land for agriculture and its chemical and physical properties, water levels, the presence of soil conditions which would increase

Soil Analysis

Plate II-2

CRANBURY TOWNSHIP

MIDDLESEX COUNTY, NEW JERSEY

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construction costs, suitability for on-site sewage disposal, and other characteristics. It should be understood, however, that because the boundaries between soil types are only approximately located on these maps due to the scale of the state-wide project, they cannot be used as the sole basis for determining development or agricultural potential. Isolated soil types within areas dominated by other soil types may be lost altogether. Also, the depth to high water level varies on a seasonal basis and is also affected by terrain characteristics. Nevertheless, although on-site testing is necessary before the undertaking of any construction, the USDA soils maps are still the best source of information regarding existing soils and are relied upon in all agricultural preservation and development efforts.

Brief descriptions of major soil classifications found in Cranbury are set forth below.

- Sassafras Series. This is an excellent soil for agriculture because of its easy workability, moderate natural fertility, and response to fertilization. Lime often needs to be added to lessen acidity. There are few limitations regarding residential development or septic systems. Depth to seasonal high water table is greater than five feet.

- Woodstown Series is another soil type that is well suited for agriculture, but only if moderately well drained. Otherwise, the subsoil becomes saturated during the winter and spring thus restricting the possibility of farming. For isolated pockets of Woodstown soil, it is sometimes possible to lower the water table and improve farm production. Residential development with sewer systems generally needs a depth of 4-5 feet above groundwater, while construction with septic systems needs a minimum of six feet above the seasonal high water table.* Since the seasonal high water table is normally only 1½ to 4 feet

*N.J.S.A. Chapter 199.

below grade, any residential development on Woodstown type soil would thus require extensive lowering of the water table or costly construction to prevent seepage into basements or shifting foundations and to allow septic systems to operate properly.

- Downer Series. Very similar to Sassafras, Downer soils have a relatively high agricultural productivity but are susceptible to erosion or low water availability, depending on soil subclasses.

Table II-3

SOIL TYPES
Cranbury Township, New Jersey

Soil Type	West of Village	Village	East of Village	Total	Percent
Sassafras	1,240	100	910	2,250	26
Woodstown	1,970	130	1,440	3,540	42
Downer	130		20	150	2
Hammonton	90	10	60	160	2
Falsington, Elkton, Humaquepts, others	450	5	540	995	12
Developed and land fill	610	175	580	1,365	16
Total	4,490	420	3,550	8,460	100

- Hammonton, Fallsington, Elkton and other Series. The other soil classifications found in Cranbury have poor agricultural or development potential qualities. Their characteristics are a high water table and poor soil quality.

b. Agricultural Capability Ratings

The USDA capability rating system categorizes the suitability of soils for agricultural production, pasture, woodland, or wildlife, based on chemical and physical properties, steepness of slope, and wetness. In total,

there are eight capability ratings, with the primary ratings for commercial crop production ranging from Class I, which has the best soil, to Class III, which has severe soil limitations. Soils below Class III are generally unsuitable for agriculture.

There are few limitations that restrict the use of Class I soils which have the widest range for crop use and present the least risk of crop damage. Accordingly, these soils are prime for agriculture. In Cranbury, Sassafras soil is the only Class I rating. It constitutes 26 percent of all lands throughout the Township and 28 percent of all land located west of the Village.

Class II soils impose limitations on the range of possible crops or require moderate conservation practices. These limitations, which may be caused by wetness, high susceptibility to erosion, or shallowness, are expressed as subclasses. A thorough understanding of the extent of any such limitations is an essential prerequisite to a determination as to whether a given Class II classification is potentially suitable for agricultural uses or whether it is best suited for wildlife, woodlands, or development.

In Cranbury, the most abundant Class II soils include Woodstown and Downer soils which comprise 44 percent of the Township and 47 percent of all land west of the Village. The most significant limitation for such soils is the seasonal high water table which ranges from 1½ to 4 feet below grade for Woodstown soils. These appear in farmed areas throughout the Township as wet spots or low ground which may impede plowing or limit crop growth areas. To the extent that these areas can be drained, the productivity of the farm is greatly improved. In the more expansive wet areas, such as found between Station Road and Brick Yard Road, and along Horse Run Brook, drainage of the Class II soils is more difficult if not downright impracticable.

c. Soil Type Analysis Summary

Plate II-2 "Soil Analysis" shows the distribution of soil types in Cranbury Township. Soils of the Sassafras and Woodstown types are dominant throughout the Township. Also, Sassafras is the major soil type present in the vicinity of Plainsboro-Cranbury Road, Cranbury Neck Road, and Old Trenton Road in the southwest, as well as in the vicinity of South River Road and Half Acre Road in the northeast. Woodstown is the major soil type found in the opposite quadrants, i.e., northwest and southeast.

The following may be concluded from this analysis of soil types:

- Cranbury Township has a significant overall base of 5,940 acres of Class I and Class II soils which are capable of supporting agriculture. Of these, 3,210 acres are located in the area west of the Village. The actively farmed lands in Cranbury, which include farms, orchards, and nurseries, cover 5,175 acres, of which 2,830 are west of the Village. The active farms are largely located on Class I and II soils.

- The high seasonal water table of much of the 2,100 acres of land classified as Class II, Woodstown and Downer soils, which are located west of the Village may limit their agricultural potential and may preclude their development altogether due to septic restrictions and other construction limitations.

  In addition to the USDA surveys, there exists an unscientific method of gauging farmland suitability which is applicable in Cranbury's case. Simply stated, all existing farmland that has been cultivated over a period of many years is ipso facto deemed suitable for farming. Accordingly, as stated above, throughout the Township there are 5,940 acres of Class I and II soils and 5,375 acres of active farmland and nurseries, almost

all of which use Class I and II soils. This means that not more than about 400 acres of the Class I and II soils may be seriously affected by high water table problems.

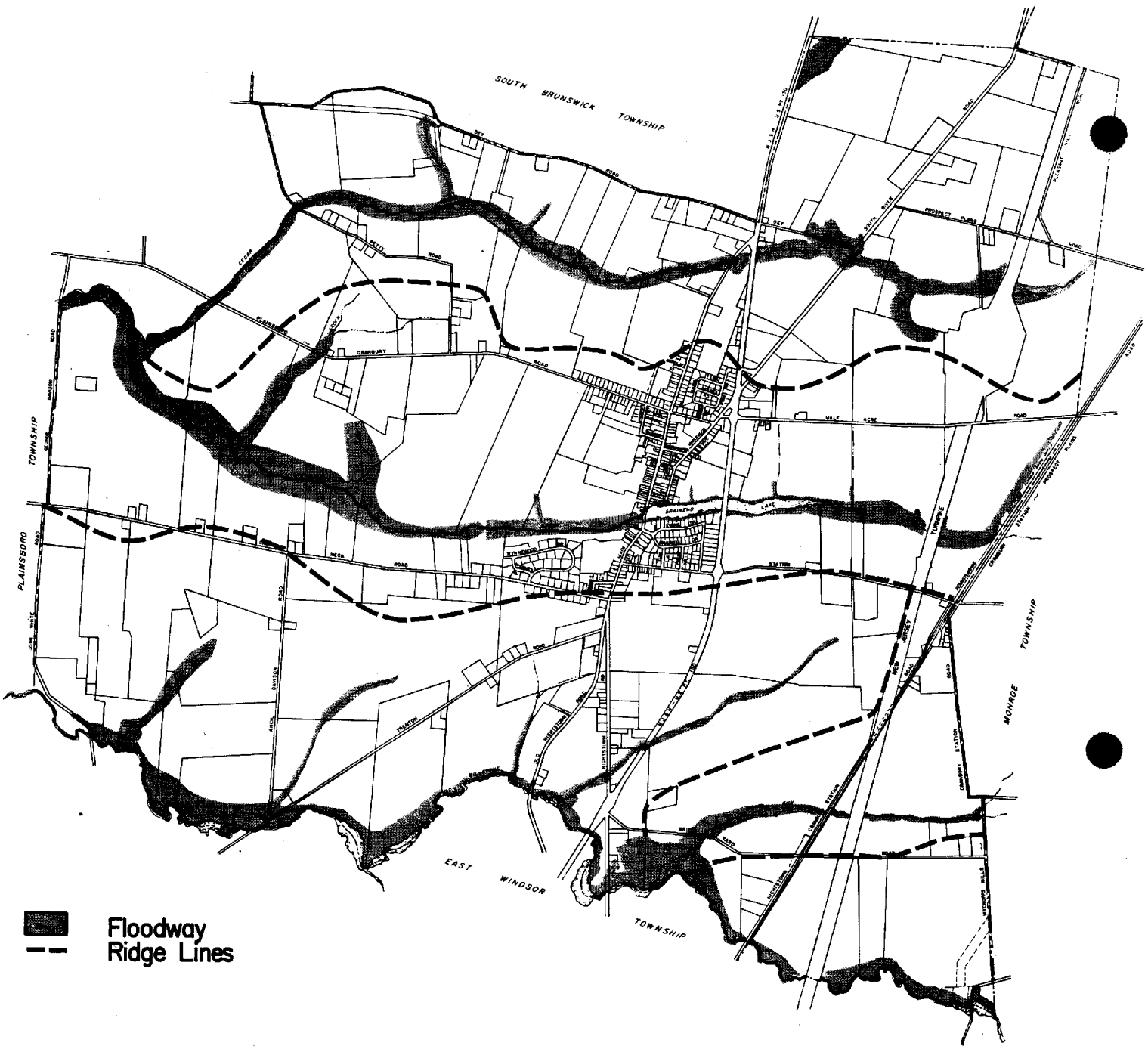
d. Floodplains Boundaries

The boundaries of areas that are subject to flooding during a 100 year storm are shown on Plate II-3. These areas should generally not be developed.

7. Development Potential Under Existing Zoning

As a means for determining the future development potential under existing zoning, a series of hypothetical full development patterns were developed based on several different assumptions.

At present, Cranbury Township has six zoning districts: R-170 Rural, requiring 40,000 square foot lots; R-100 Residence, Village Area, requiring 15,000 square foot lots; Neighborhood Business; Highway Business, with no bulk restrictions; Industrial, permitting a maximum 30 percent building coverage; and Research and Office, also permitting a maximum 30 percent building coverage within a total of 50 percent coverage with impervious surfaces. Areas available for development, by zoning district, under existing zoning and, more realistically, as affected by soil types, are shown in Table II-4 "Zoning and Environmental Restraints Affecting Development Potential of Undeveloped Land." The development potential under the two assumptions is shown in Table II-5 "Development Potential Under Existing Zoning and Environmental Restraints." The development potential assumed in this analysis is based on standard planning criteria and experience in other communities.



Flood Plains

Plate II-3

CRANBURY TOWNSHIP

MIDDLESEX COUNTY, NEW JERSEY

Raymond, Parish, Pine & Weiner, Inc. Consultant, Tarrytown, NY Princeton, NJ

0 1600ft. 3200

Table II-4

ZONING AND ENVIRONMENTAL RESTRAINTS AFFECTING DEVELOPMENT POTENTIAL OF UNDEVELOPED LAND, CRANBURY TOWNSHIP
(in acres of undeveloped land)

Use	Existing* by Zone	Class I Soil	Class II Soil	Class I Soil + 50 Percent Class II Soil
R-170, Rural	4,285	1,340	2,220	2,450
R-100, Residence	10	10	--	10
Neighborhood Business	20	**	--	--
Industrial	2,700	910	1,460	1,640
Research and Office	280	--	--	--
Total	7,295			

*See Existing Land Use for further analysis.

**Less than 5 acres.

Table II-5

DEVELOPMENT POTENTIAL UNDER EXISTING ZONING AND ENVIRONMENTAL RESTRAINTS

Use	Theoretical-Ignoring Environmental Restraints	Practical-As Affected by Environmental Restraints: Class I Soil + 50 Percent Class I Soil
R-170, Rural	8,034 residents 3,214 du	4,595 residents 1,838 du
R-100 Residence	20 residents 8 du	20 residents 8 du
Neighborhood Business	N/A	N/A
Highway Business	N/A	N/A
Industrial	2,700 to 21,600 employees	1,640 to 13,120
Research and Office*	840 to 2,240 employees	840 to 2,240 employees
Residential	8,054 residents 3,222 du	4,615 residents 1,846 du
Employment	3,540 to 23,840 employees	2,480 to 15,360 employees

*There are no environmental restraints in areas zoned in the Research-Office classification.

To compute maximum potential residential development it was assumed that each potential dwelling

would be occupied by 2.5 people. This corresponds to the 1980 countywide average of 2.6 persons per unit and takes into account the general trend toward fewer people per household. The number of units per gross acre was established by deducting 25 percent from the gross area for streets, detention basin requirements, and dwellings that are likely to develop on lots larger than 40,000 square feet.

For office and research uses, the assumed range of employees per gross acre was 3 to 8; for potential industrial uses, the assumed range of employees per gross acre was 1 to 8. These ratios are commonly used in regional studies.

(a) Existing Zoning

Based on the above assumptions, under current zoning Cranbury's maximum residential development potential amounts to 3,222 dwelling units and non residential development which could generate anywhere from 3,540 to 23,840 employees. These figures assume full development of every acre of land in the township. In fact, however, the development potential will be diminished somewhat for a variety of reasons, including poor soils, inefficient use of land, reservations of open space, etc.

(b) Assuming that Class I Soils and only 50 Percent Class II Soils are developable

For purposes of this analysis it was assumed that all Class I soils and only 50 percent of Class II soils are suitable for development. This assumption is based on the severe restrictions due to the presence of a high water table which affect much of the Woodstown soil types. This method of estimating development potential produces about 1,850 additional dwellings and additional employment in the 2,480-15,360 range.

8. Agricultural Analysis

In the past, the growing agricultural demand on the Nation's farms was easily met with increased agricultural productivity, and large farmland

reserves. The dynamic changes in world population growth, global economics, and environmental factors in recent years have influenced the demand for agricultural products grown in the United States. Some current projections suggest that "during the 1980's, a combination of world demand and steadily growing domestic demand [will] outstrip the productive capacity of the agricultural economy."* The shortfalls are expected to result from the world-wide 1.8% annual rate of population increase which will bring the total to 5.2 billion by 1990; to rising standards of living and changing diets; and to the decline in productivity of farm lands in many parts of the world due to eroding soils and climate changes.

The resulting increases in grain exports from the U.S. are exerting considerable pressures on both the internal availability and prices of agricultural products. This pressure is aggravated by the estimated annual conversion of some 3 million acres of agricultural land to other uses.** "If American farmers are to continue to meet domestic and foreign demands for food, they will have to plant...140 million acres of land" over and above the 413 million acres currently being farmed.** This will be difficult to achieve, given the Department's estimate that there are only 127 million unfarmed areas that are potentially useable for farming.***

An additional serious threat to the preservation of farmland is the increased erosion which results from the mechanizationof agriculture attendant upon increases in the size of farms. Because of mechanization hedgerows and soil terraces are being leveled and the conservation-oriented contour farming techniques introduced in the 1930's are being abandoned. The extent of the erosion is so severe that, according to a recent report, "if soil erosion in the fertile corn belt states of

*"Replacing Energy or the Inflation Villain", Business Week, June 1, 1981.

**National Agricultural Lands Study, Final Report, 1981, U.S. Department of Agriculture and the President's Council on Environmental Quality.

***"Action Sought to Help Protect U.S. Farmlands" New York Times, January 17, 1982.

the Middle West continues at current rates for another 50 years, corn and soy bean yields could be reduced by 30 percent."*

To compensate for the conversion of agricultural lands to other uses, a series of recommendations in the National Agricultural Lands Study would "encourage[e] development and use of marginal, less productive agricultural lands whenever such lands are available."**

This is the national context in which plans for the future of the highly productive agricultural lands in Cranbury must be developed.

(a) Agricultural Productivity

As part of a state agricultural survey, the Middlesex-Somerset-Mercer Regional Study Council (MSM) produced a report entitled Planning For Agriculture in New Jersey which concluded that agriculture comprises 20 percent of all of the state's land uses and that the agricultural industry contributes importantly to local farm markets, reduced food costs, employment opportunities, and continued availability of farmland for the nation.

In a separate report dealing specifically with "Cranbury,*** MSM notes that the Township "is the key to a larger agricultural area including parts of Plainsboro and South Brunswick, and smaller parts of East and West Windsor" and includes Monroe and Washington Townships as part of the regional agricultural community. MSM identified 31 farm operations in the Township that were involved in the production of grain, potatoes, nursery items, tree fruits, flowers, vegetables, hay and soybeans, as well as cattle raising. All of this activity is important for the local economy, local job opportunities, and the satisfaction of regional food needs. Under-

*"New Plans in the Works to Save the Good Earth," New York Times, October 11, 1981.

**National Agricultural Lands Study, Final Report, 1981, page 89.

***Agricultural Retention in Cranbury, MSM, March 1982.

standably, MSM thus considers farm land to be an important irretrievable natural resource.

(b) Farm Area Characteristics

Cranbury's farm ownership patterns and farm tract characteristics were determined by means of a study of all tax lots having an area of five acres or larger in that portion of the Township which the New Jersey State Development Guide Plan designated as Agricultural Areas. The study used the tax maps dated April 14, 1981 and assessment information current as of February 1982.

The area earmarked by the State for agricultural conservation is generally that located west of the Village. This area encompasses 4,490 acres of land. The findings of a review of all parcels consisting of five or more acres are summarized below:

- Total number of parcels -- 78 with an average area of 50 acres
- Number of parcels with farmland assessment -- 65, or 83%
- Total land area studied -- 3999.4 acres
- Land area with farmland assessment -- 3739.9 acres, or 94%
- Farmland assessment per acre -- from $126 to $1,041, with an average of $419
- Land area under other than farmland assessment -- 259.5 acres
- Number of parcels under other than farmland assessment -- 13
- Average non-farmland assessment per acre -- $2,487
- State equalization ratio -- 68%
- Number of parcels owned by non-Cranbury residents -- 28, or 35.9%

- Number of acres owned by non-Cranbury residents -- 1647.7, or 41.2%

(c) Market Value of Land for Agriculture and Development in Cranbury

To anticipate the effect on land values of the implementation of any land use program, it is necessary to determine the general level of market values of land within the affected area.

As part of a broad survey of agricultural land values, the Middlesex-Somerset-Mercer Study Council (MSM) reviewed seven land transactions in Cranbury Township which occurred during the period between 1977 and 1980 (see Table II-6). The recorded land sales included only parcels of six acres or more. Their findings showed that the average price for agricultural land ranged between $2,083 per acre for large tracts and $7,500 per acre for tracts under 10 acres. These values reflect permitted uses and the current market for such uses, location, availability of water and sewer facilities, suitability for on-site sewage disposal, access, the land's agricultural productivity and the value of farmland as a tax shelter. An important finding of this study is that the price of land may also be inversely related to size of parcels.

Table II-6

FARMLAND SALES, CRANBURY TOWNSHIP
1977 TO 1980

Block	Lot	Year	Acres	Cost/Acre
24	1	1977	134	$2,083
--	--	1978	10	$3,889
23	8	1978	6	$6,833
23	11	1979	181	$2,314
24	4	1979	6	$6,145
23	153, 153Q	1980	6	$7,500
21	61	1980	6	$7,500
14	1	--	28.4	$2,507

Source: Middlesex-Somerset- Mercer Study Council.

According to informed builders and developers in the area, the value of land in Cranbury for fee simple townhouses and condominium developments would range between $5,000 and $8,000 per unit. These values are tentative, at best, since ultimately they are affected by fluctuations in interest rates, locational differences, availability of services, and changes in the market for the particular product.

(d) Recent Developments in the Agricultural Area

Four major subdivisions in the agricultural area west of the Village received approvals prior to commencement of this study. Three of these are located in the vicinity of Old Trenton Road.

North of Old Trenton Road stands the completed Cranbury Farms I subdivision which consists of 24 single family units on 27.8 acres of land.

South of Old Trenton Road and directly opposite Cranbury Farms I is Cranbury Farms II which is also known as Shadow Oaks. The preliminary subdivision plat approval dated November 15, 1979, covers 68 single family units on 90.3 acres of land. On May 14, 1981, approval of a final subdivision plat

authorized construction of 16 units which is currently underway. The preliminary approval for the remainder, which expires November 15, 1982, may be extended at the discretion of the Planning Board.

To the west of Cranbury Farms II lies the 45-acre Cranbury Land Company development. Preliminary approval for 24 single family units on this tract was granted on September 18, 1980 and will expire three years later. None of these are as yet under construction.

9. Circulation Structure

Various roads in Cranbury Township are under the jurisdiction of three levels of government: state, county, and local. The only state road (exclusive of the New Jersey Turnpike) is Route 130; county roads include Dey, Station, Hightstown, Maplewood, Cranbury Neck, Park Place, Old Trenton, South River, and Main Street; township roads include the remainder.

For purposes of analysis in Cranbury, however, the functional use of roads rather than jurisdiction is the better indicator of the purpose they serve. Understanding the type and function of roadways is an important first step in analyzing the capacity of the local circulation system preliminary to the implementation of whatever improvements may be required in the future.

(a) Principal Arterials

Route 130, a four lane road, is the only principal arterial currently operated by the state with access in Cranbury. Ideally, this type of road, which provides region-wide service, should be a limited access facility, linking major arterials. This is not the case in Cranbury, however, where several commercial strip developments with access to the highway are scattered along its entire length.

Another major state road, Route 92, is currently under consideration. If constructed, this road will run from Route 1 in South Brunswick to Route 130 in East Windsor

through the southwest corner of Cranbury. Neither the feasibility nor the character of this proposed facility have been firmly determined. If this proposal is pursued, the Township should endeavor to preclude any access thereto from Cranbury Neck Road in Plainsboro or any road in Cranbury. A possible alternative to Route 92 that has been advanced is the improvement of Dey Road from Sudders Mill in Plainsboro to Route 130 in Cranbury.

(b) Major Arterials

These serve as major channels for the movement of people and goods between principal arterials. Ideally, they should be designed with rights-of-ways ranging from 80 to 120 feet, and with direct controlled access from roadside properties. The only road in Cranbury that would qualify for designation as a major arterial by virtue of its being the main link between Exit 8A of the New Jersey Turnpike and Route 130 is South River Road. The existing right-of-way of this highway ranges from 66 to 93 feet. The County proposes that it be widened to a uniform width of 120 feet.

(c) Minor Arterials

This type of roadway consists of intra-community links between major arterials and local development concentrations. In developing areas, many minor arterials evolve from purely local roads that provide access to properties into important components of the regional arterial system as the intensified development in the region increases the volumes of traffic which they are called upon to carry.

Most of the minor arterials in Cranbury are county roads. These include Old Trenton Road, Station Road, Hightstown Road, Main Street, Maplewood Avenue, Park Place, and Cranbury Neck and Dey Roads. As stated above, one of these roads, Dey Road, may change function, although not jurisdiction, as the Route 92 feasibility study unfolds.

With the construction of Scudders Mill Road in Plainsboro and the improvement of Ridge Road in South Brunswick, Dey Road could become a major arterial.

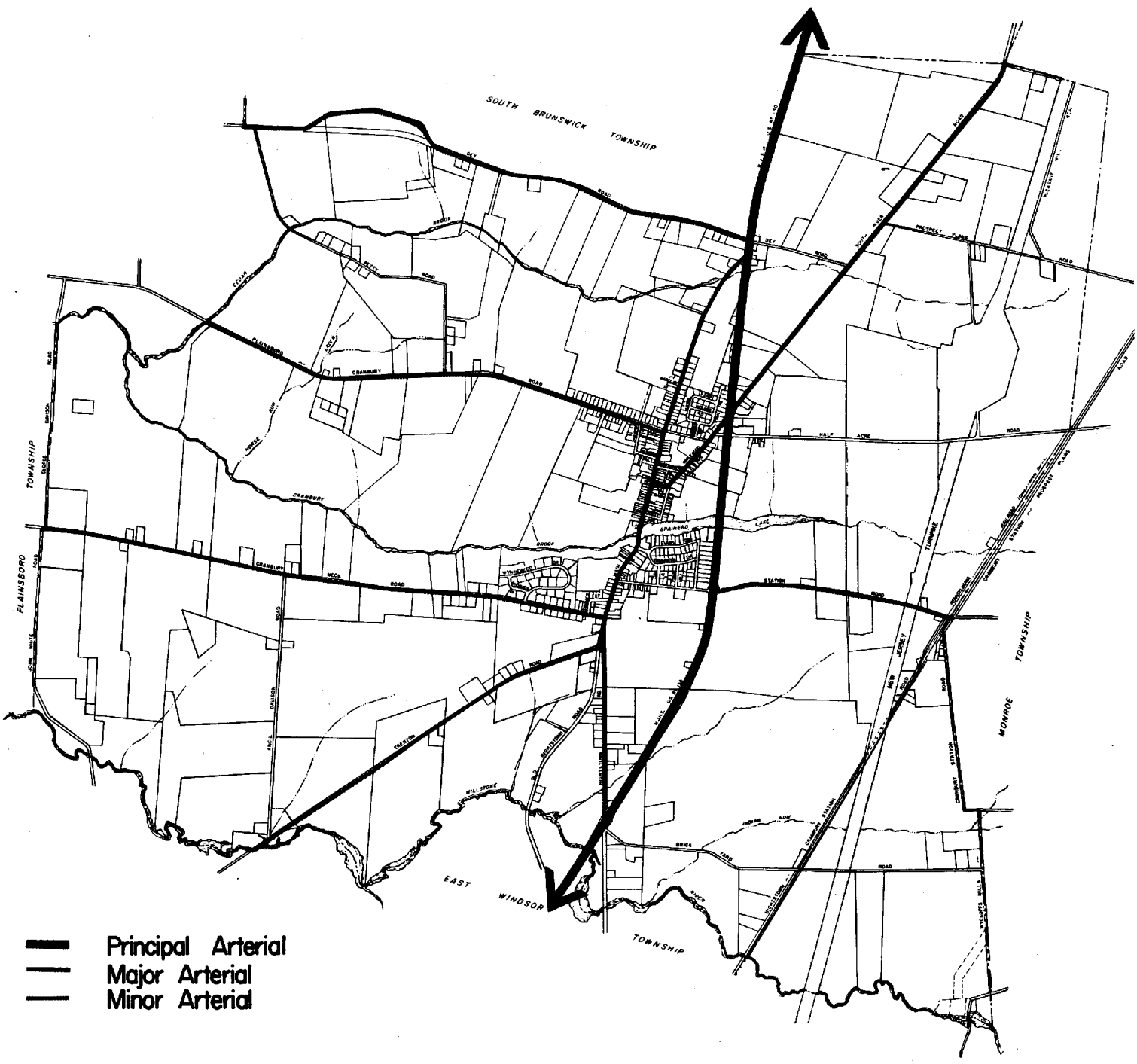
The only township road which now serves as a minor arterial and which is also the principal road serving the Linpro development in Plainsboro is Plainsboro-Cranbury Road which connects Route 1 with Route 130. Studies anticipate that, by the year 2000, the average daily traffic (ADT) from the intersection of the proposed new Scudders Mill Road in Plainsboro with Plainsboro-Cranbury Road will amount to some 11,000 vehicles and the design hour volume (DHV) to 2,200 vehicles. As part of the Route 92 studies, New Jersey DOT will update those figures, and Cranbury will then be able to adjust its right-of-way requirements and its land development policies accordingly.

(d) Circulation System Analysis

The Roadway Classification Map (Plate II-4) helps identify opportunities for more intensive development and some of the circulation-related constraints which must be observed in the development of a land use plan.

That part of the Township which is located east of Route 130 is best served by a substantial system of principal, major, and minor arterials. The collection and distribution system enable traffic to flow easily to and from Route 130.

The roadways which pose the greatest potential problems for Cranbury and its Village area are Plainsboro-Cranbury Road, Old Trenton Road, and to a lesser extent, Cranbury Neck Road. Under the existing zoning, these roads will provide regional access to Route 130 through the Village. All east bound traffic generated in Cranbury between Cedar Brook and the Millstone River as well as all regional traffic that may materialize in time must converge at three intersections and filter through the



Existing Road Classification

Plate II-4

CRANBURY TOWNSHIP

MIDDLESEX COUNTY, NEW JERSEY

Raymond, Parish, Pine & Weiner, Inc. Consultant, Tarrytown, NY Princeton, NJ

0 1600ft. 3200

village's streets. Under full development, even excluding regional traffic, this will generate approximately 2,000 trips during the afternoon peak hour. Such a high volume of traffic would affect the quality of the officially-designated Historic District, downgrade the livability of the Village's residential areas, and harm its businesses. Minimizing traffic through the Village will enhance its unique character and will help preserve the Historic District.

10. Public Utility Services

(a) Water

The Cranbury Water Department services 525 homes in the Village area. Water is pumped from three wells approximately 250 to 325 feet deep with a total capacity of 1.11 million gallons per day.

(b) Sewers

The Cranbury Township sewer system consists of a collection system, a pumping station with a peak capacity of 840,000 gallons per day located on Cranbury Brook west of Main Street, a forced main to South Brunswick for the conveyance of sewage to the Middlesex County Sewage Authority treatment plant, and a 256,000 contract with South Brunswick to handle up to 256,000 gallons of sewage per day. The existing collector sewer network, shown on Plate II-5, was designed primarily to collect effluent from the Village. According to the Master Sewerage Plan,* the existing sewerage system for the Cranbury Brook basin will be expanded along the northern edge of Brainerd Lake and Cranbury Brook to a point just east of the Turnpike. The proposed main trunk line will range from 24 to 15 inches. At present, an existing 24-inch line along Scott Avenue dead ends at Maplewood Avenue. This is the only point from which the system can be expanded easily without incurring extraordinary engineering costs.

*Sewage Master Plan, Report No. 1551-1, Kupper Associates, Inc., July 1969.

11. Summary of Planning Issues

(a) Introduction

The above analysis has identified a series of land use, environmental, and transportation planning issues ranging from regional concerns to very specific local ones. All of these will have to be addressed in the Master Plan. These issues and their implications are summarized below.

ISSUE	PLAN IMPLICATION
Regional	
State Development Guide	To be consistent with the State Development Guide, the area west of the Village should be kept agricultural, with growth channeled into the areas located generally east of Route 130.
Middlesex County Master Plan	Preliminary population projections for Cranbury indicate an increase from 1,927 in 1980 to 4,600 in 2000. (These may be modified after completion of the analysis of the 1980 Census results.) Little additional non-residential development in the Township is shown for the year 2000.
Land Use Policies in Adjoining Municipalities	South Brunswick proposes to preserve its agricultural area by means of large lot zoning (3-acre minimum). Plainsboro is considering the use of TDC to preserve its agricultural area, giving one development per acre credit but establishing a minimum lot area requirement of 6-10 acres. In Cranbury, some 3,650 acres of land in the area located west

	of the Village may be preserved in a way that would complement similar programs in the adjoining communities. In the development corridor defined by the State Development Guide Plan, South Brunswick, East Windsor and Monroe Township are zoned for a variety of industrial uses.
Regional Sewer Treatment Facilities: 201 Facilities Plan and Monroe Township Utility Authority	The opportunity exists for the use of some excess sewage treatment capacity in the northeast part of the Township.
Local	
Preservation vs. Development	Cranbury Township's total area amounts to 8,460 acres, of which approximately 1,000 are urbanized, 5,400 are used for agriculture, and over 2,000 are environmentally sensitive. If the Township will follow the State Development Guide Plan, it can preserve over 3,500 acres of basically agricultural land in the area west of the Village. All the new growth would be located north and south of the Village area as well as in the entire area between Route 130 and the Monroe Township boundary. The largely vacant, environmentally sensitive area in the vicinity of Brick Yard Road should be retained as a low intensity area. The area between Cedar Brook and Dey Road, only one third of which is in agricultural use and the remainder of which does not consist of lands with a high agricultural

productivity potential, should also be retained as a low intensity area in harmony with the zoning in the adjoining area in South Brunswick.

Vacant developable land in the northeast corner of the Township should be set aside for industrial development in harmony with the land use policies of South Brunswick across the line.

Given the present nature and expansion possibilities of the existing sewer system, the only real opportunity to expand and intensify residential development in the Township is in the area across Route 130 from Scott Avenue on the north side of Brainerd Lake.

C. Agricultural Land Preservation Techniques

Many techniques for saving farmland from development have been advanced over the past ten years, mostly by local and county governments. Each technique has been designed to meet unique local goals and circumstances. Some systems have been implemented and a few resulting programs have been moderately successful. To a large extent, however, agricultural land preservation methods are still in a state of evolution. It should be noted that, in New Jersey, in light of the Mount Laurel and Madison legal doctrine, agricultural land preservation through the use of police powers would only be valid if adequate land in the community or region is zoned to accommodate needed growth.

The following summary outlines the fundamental workings of the most frequently encountered programs.

1. Large Lot Zoning and Exclusive Agricultural Zoning

The oldest and most frequently encountered technique for conserving farmland is large lot zoning which slows development by deflecting the pressures to areas zoned more appropriately for

residential use. To encourage farming, the chosen lot size should be a function of established local practices and the desires of the community, but, if it is to be effective, must be no smaller than the size needed to maintain the vitality of the particular variety of agricultural activities involved. In practice, minimum lot standards vary from 6 to 25 acres in New Jersey to 320 acres used in grazing areas in California. In other instances, especially in the west, minimum acreage requirements are linked with irrigation--for example, 80 acres minimum with water and 160 acre minimum for dry farming. New Jersey's 6-acre minimum is related to the minimum 5-acre area which the Farmland Assessment Act of 1964 requires for eligibility, plus an additional acre for the farmstead, rather than the minimum required for assuring the continuation of farming. In the opinion of some New Jersey farmers, to be economically feasible, grain farming requires at least approximately 300 acres. In some states along the east coast 30 acres is deemed to be the minimum acreage necessary to support vegetable farming.

While large lot zoning may be a reasonable approach in predominantly rural municipalities, it may be less effective in growing suburban communities. At issue is whether or not large lot zoning can preserve farmland as a natural resource and encourage the indefinite continuation of farming regardless of short term market cycles. Large lot zoning frequently turns into a mechanism that temporarily redirects growth to other areas of the community where agricultural activity is not significant. When these are developed, the Master Plan is revised to reflect changed conditions by releasing agricultural lands for development of all types.* For this reason, some advocate zoning that would restrict the use of prime agricultural land exclusively to agricultural pursuits, in the hope that this would enhance the economic future of farming and thereby prove agricultural zoning to be as reasonable a form of land use regulation as is commercial and industrial zoning.

A variation on large-lot zoning would permit landowners to cluster the undeveloped portions of

*In New Jersey, the Municipal Land Use Law requires that the Master Plan be reviewed every six years.

their "farmettes," so as to create substantial working or "farm colonies,"* properly buffered from residential lots. The operating responsibility for the farms is placed on the homeowners' association which can use farm produce revenues to help defray their expenses. In Cranbury this concept might be applicable if smaller scale production of vegetables or other specialty crops were to supplant the present large scale grain and potato crop production.

The impact of exclusive agricultural zoning can be mitigated somewhat by permitting owners to cluster dwelling units on those portions of their holdings that are not suited for farming and not located in an area where they would interfere with farming operations. This system, which has been used particularly in Pennsylvania, provides relief by recognizing that unusual situations tend to be "papered over" when general standards are applied to large areas of land. This type of flexibility, which would permit land owners to develop small clusters of dwellings, would be applicable in Cranbury on condition that all such development is (1) properly screened from all agricultural operations; (2) constructed on Class III or less soils; and (3) so located as to preserve the integrity of environmentally sensitive areas. Given Cranbury's natural setting, this would release only limited sites for development.

Another way in which the impact of exclusive agricultural zoning on the landowner can be mitigated is by permitting development on the land in inverse proportion to the size of the holding, so that smaller parcels would be permitted a proportionally greater intensity of development than larger ones. This approach is based on the proposition that small lots are less critical to the retention of the community's agricultural base and that large landowners are more committed to agricultural production. This system is applicable in areas where agricultural lands are subdivided with a larger proportion of smaller lots in agricultural areas than is the case in Cranbury and where development pressures are essentially absent.

*These terms were devised in the Virginia suburbs of Washington, D.C. where the concept originated.

In Cranbury Township, neither large lot zoning nor exclusive agricultural zoning, singly or together, can be relied upon for the preservation of agricultural lands in perpetuity. Given the strong development pressures that are already extant in the region, if large lot zoning is used by itself,it may not be possible to require lots larger than those now required in adjoining municipalities. Even if the minimum could be increased to say, as much as 6 to 10 acres per dwelling unit, it would help retard development of agricultural lands by redirecting it to other areas but would probably fail to deflect it therefrom permanently. As for exclusive agricultural zoning, if upheld, it would effectively set aside land for farming. The chances of its surviving a legal challenge, however, are not certain as the Township may find it difficult at present to demonstrate the reasonableness of as drastic a reduction in the permitted use of land located in the dynamic New York-Philadelphia corridor.

The future may be different in that regard since the limits of the police power are in flux. Traditionally, the New Jersey courts have deemed zoning which precludes all reasonable use to be tantamount to a taking. In a few recent cases, however, particularly in connection with the Pinelands Plan and the regulation of uses in the Coastal Zone, the courts seem to have accepted dramatic reductions in development potential as reasonable where it was shown that the public interest will be severely harmed by a change in the character of the property. It is even argued by some that, pursuant to the most recent U.S. and New Jersey Supreme Court decisions, it can be confidently asserted that development is not the only reasonable use of land.

In Cranbury's case, therefore, the central questions that must be answered if exclusive agricultural zoning is to be considered are the following:

- Are there significant public benefits to be gained from the retention of particular lands in agricultural use?

- is the permitted agricultural use, with such mitigating features as may be deemed appropriate, economically feasible to the point of being accepted as a reasonable use of the land for now and the foreseeable future?

- will withdrawal of the agricultural lands from development leave sufficient other lands to accommodate local and area-wide growth needs?

2. Farmland Assessment Act of 1964

Because New Jersey's local governments rely heavily on real estate taxes for support of governmental functions, the tax burden on farmers and farmland owners became onerous to the point of imperiling the continuation of agriculture in the state. This situation led to the enactment of a Farmland Assessment Act in 1964 to provide tax relief.

The basic premise of the Farmland Assessment Act is that the value of agricultural land is a function of its productivity rather than its market value for other uses. To qualify for special assessment under this law, a tract must have an area of at least five acres, must have been in agricultural use for not less than two years, and must produce a minimum gross income of $500 for the first five acres and $5 per acre above that level. The law recognizes four categories of farmland: cropland, cropland pasture, permanent pasture, and woodland. Each category is assessed on a productivity index which was established by Rutgers University, Cook College. In Middlesex County, in 1982, the suggested special assessment per acre ranges from $456 for Class A farmland to $13 for Class E woodland. In Cranbury, nearly all the lands which are now in agricultural use are taking advantage of farmland assessments. It should be noted, however, that in developing areas this system strongly encourages the speculative withholding of land from development rather than the perpetuation of agricultural uses since the only penalty for conversion of such land to other uses is a two-year roll-back of taxes on the difference

between its value for agriculture and its value for development.

3. Agricultural Districting

Agricultural districting is a farmland preservation policy which is being implemented in other states, including New York. It combines positive incentives to encourage farming with negative incentives to discourage nonfarming activities. An agricultural district may be organized by a group of farmers who qualify by meeting standards of productivity, economic viability, and other criteria, and who agree to continue farming in return for certain benefits.

Districts are established following the mapping of the state's agricultural regions and the inventorying of its farms. A percentage of all farmers in eligible areas who, together, own a minimum number of acres (in New York, 500 acres or 10% of the land proposed for the district) must agree to form a district. The benefits to district farmers include lower assessments (lower in New York State than those provided by New Jersey's Farmland Assessment Act), limits on special tax levies for services, etc., and a required administrative hearing prior to any taking for roads and other facilities to avoid interference with farm operations. In return, farmers agree by contract not to develop their lands for a period of time, usually eight to ten years. While fines and/or tax roll-backs are imposed if contracts are broken, there is no tax roll-back or other penalty if, in order to realize higher development-related values, the owner, chooses not to renew participation in the district after the expiration of the statutory period.

By their very nature, agricultural districts can serve to strengthen the economic position of farmers in areas where farming is the dominant enterprise and land use. But as was the case with New Jersey's farmland assessments, agricultural districts in developing areas may simply make it easier for speculators to hold the land longer in the hope of greater value appreciation.

This type of program is currently under consideration in New Jersey in the form of a number of

proposed bills that would help implement the recently passed Agricultural Bond Issue. The applicability of this concept to Cranbury will depend upon the nature of the legislation that may be enacted.

4. Blueprint Commission Report

The Blueprint Commission's work represented the first official study by the state government of the feasibility of comprehensive and systematic preservation of farmland in New Jersey. The Commission's 1973 report set forth five major policy recommendations, the principal one of which was that each municipality throughout the state be required to designate an Agricultural Open Space Preserve comprising at least 70 percent of the prime farmland within its boundaries. The state would be enabled to purchase development easements within the preserve and compensate the owners to the extent of the difference between market value for development and market value for agricultural production. Optionally, these easements could be held in a land bank and sold to developers at a later date at a higher price. After the easement purchase, the land would remain in agricultural use in perpetuity.

The Commission's proposals also represented the first official recognition in New Jersey of the distinction between land and its development rights. The Commission was careful to note, however, that, in its opinion, the transfer of development rights, by itself, would not make possible the conservation of farmlands throughout the state.

The Commission's proposals were criticized mainly because the proposed withdrawal of land from development was not accompanied by provisions that would assure the availability of land to accommodate growth elsewhere, and because of the high cost of implementing the acquisition program. Opponents also contended that the removal of so much land from the market would cause the price of remaining farmlands and developable lands to increase dramatically.

5. Burlington County Demonstration Project

To test the Blueprint Commission's recommendations the State of New Jersey tried an experimental project in Burlington County. Four communities--Lumberton, Southampton, Medford and Pemberton --were targeted for the purchase of farmland development rights. The pilot project was funded with $5,000,000 from Green Acres funds. The pilot plan estimated that this amount would be sufficient to enable the state to purchase the development rights to approximately 5,000 acres.

The owners of over 18,600 of the 41,500 eligible acres in the demonstration project area had expressed interest in participating in the program. Easements for 1,700 acres were ready for purchase but at an average price of nearly $2,000 per acre. As a result, funding was delayed, and ultimately, the program was aborted. In the opinion of some, any program involving the public purchase of farmlands triggers an increase in land values and causes the public cost of preserving limited agricultural acreage to exceed estimates. Another reason why the program may have failed to gain support is that it affected only a relatively few individual owners in a small part of the state.

Even though terminated, this demonstration program may have been responsible for the increased public support of purchase of development rights by government. Bond issues for some $2 million each were approved by the voters of Burlington and Hunterdon Counties in the last five years.

6. Transfer of Development Rights (TDR) and Transfer of Development Credits (TDC)

The feasibility of using a transfer of development rights (TDR) technique for the achievement of major land planning objectives has been under discussion since 1960 when it was suggested as a mechanism to preserve historic landmarks in Chicago. Since then, it has been used or proposed to be used in other states and communities for a wide variety of purposes including historic preservation in New York; agricultural conservation in New Jersey, Pennsylvania, Maryland, and other states; steep slope conservation in

California; and the creation of parkland in New Rochelle, New York. The concept seems to be gaining momentum on a national scale due to increased interest in redirecting growth in order to conserve natural resources, environmentally sensitive lands, or historic landmarks, and to the realization that outright acquisition by the public of the development rights involved would be prohibitively expensive.

The New Jersey Open Space Policy Commission provided funds to Rutgers University for the development of a workable TDR concept and the drafting of appropriate enabling legislation. South Brunswick, New Jersey, was chosen for an exploration of the feasibility of compensating landowners for the speculative value of their land which they were asked to forego in the public interest by enabling them to sell their development rights for use in other locations.

The South Brunswick proposal failed in part because of its unfamiliarity, but most likely primarily because some of the proposed features of the recommended TDR system made it unacceptable to both the landowners and the municipality. These include: depriving landowners in preservation areas of all uses of their land except farming or open space which was deemed unreasonable even though the affected owners were given the right to sell the denied development rights to others for use in development areas; complexity of program administration by the municipality; legal questions raised by the separation of development rights from land; the feasibility of taxing development rights as real estate; the fairness of issuing development rights certificates on the basis not of the intrinsic value of each parcel but of the relationship of its value to the total value of all land in the preservation district, etc. No clear-cut consensus was ever achieved as to whether the concept could have withstood a legal challenge or, indeed, whether it could even work within the parameters established in the study.

Due to the difficulties of using the TDR system the system that is currently favored is a similar one called "transfer of development credits" (TDC). While this approach is also based on the

transfer of development potential from one area to another, TDC allows owners in preservation areas a reasonable, albeit minimum, use of their land and offers them additional negotiable development credits as an incentive to induce them to favor transfer over development. Under this system, the developer who proposes to use credits originating in preservation areas in order to build to a higher density in "receiving" areas must control the land where the credits originate to an extent sufficient to be in a position to guarantee that it will remain permanently in the prescribed residual use (open space, farmland, etc.). The municipality's role is limited to that of reviewing the developer's compliance with the adopted "conditional use" provisions of the zoning ordinance which govern development in the receiving area and of enforcing the restrictions in the areas to be preserved.

To date, five New Jersey municipalities have enacted TDC as a method of preserving farmland. Two of these, Chesterfield (in Burlington County) and Hillsborough (in Somerset County), have reviewed TDC applications; Chesterfield approved a preliminary application for 1,042 units which, upon final approval, will make possible the preservation of approximately 500 acres of prime farmland. In addition to these two townships, 56 municipalities located in the Pinelands are also involved in a regional TDC program, and Cranbury's neighbor, Plainsboro Township is currently considering the feasibility of using it to preserve some 1,400 acres of farmland adjacent to Cranbury. East Windsor is currently considering a TDR ordinance which, if adopted, would be the first in the state to follow that method of farmland preservation.

Set forth below is a brief description of the manner in which a TDC system could be used to preserve agricultural lands.

(a) Designation of a Preservation Area

The planning process must begin with an examination of the existing use of all land and of the development potential of all undeveloped land, environmental factors, development trends, and systems capacities

with an emphasis on the current and future capacity of the circulation, water, and sewer systems. The agricultural areas to be preserved through TDC should be delineated generally in areas devoid of sewers, water, and major roadways. Since continued intensive agricultural use would be incompatible with adjoining residential uses, wherever strong natural boundaries are absent, provision should be made for buffer areas sufficient to protect such uses. The area to be protected should encompass sufficient acreage to give reasonable assurance that the continuation of agriculture into the indefinite future will be economically feasible. The delineation of agricultural preservation areas will be capable of withstanding pressures for change when the Master Plan is reexamined every six years as required by the New Jersey Municipal Land Use Law only if done with great care and with maximum public support.

Once delineated, the agricultural area should be zoned so that the permitted use of the land and base density will give the owner a reasonable use of his land. In addition, the system should offer owners incentives in the form of negotiable development credits in sufficient amounts to cause them to voluntarily accept restrictions limiting the use of their land exclusively to agricultural or open space uses in exchange for the opportunity of transferring their development potential elsewhere.

(b) Designation of a Receiving Area

The market for development credits is created through the establishment of appropriate areas where development may be intensified following the transfer thereto of development potential from preservation areas. Generally, land in such "receiving" areas is granted a low base density premised on minimal capital improvements. Owners in receiving areas are free to develop to the base density as-of-right or to any level between the base and the maximum permitted density upon purchase of development credits

from the preservation area. The municipality must be prepared to cooperate in the provision of the infrastructure (roads, sewers, etc.) which would be required to serve the higher density.

(c) Determination of Credits in the Preservation Area

The several TDC systems that are currently in operation use different methods of determining the number of credits which should be awarded the owner of a given parcel of land. Generally, the number must represent the approximate value of the difference between the residual value of the land for agricultural use and its market value at the time of enactment of the TDC system. This was the approach adopted by the Pinelands Commission which used approximate land values as an initial step for determining transfer credits in the preservation area.

7. New Jersey Agricultural Retention and Development Program

In 1981, New Jersey voters passed a $50 million agricultural bond issue to help finance the purchase of farm land easements and to promote soil conservation. The funds which were thus made available may be used to subsidize 50 percent of the cost of purchase of easements or development rights, with county or municipal governments assuming responsibility for the remainder. Several bills are now under consideration in the State Legislature to determine the method of implementation of the preservation program. None of these bills would authorize more than $10 million of the $50 million to be expended at this time.

III. LAND USE PLAN

III. LAND USE PLAN

A. The Challenge

On the surface, Cranbury has the appearance of a tranquil, remote agricultural community focused on a historic village by-passed by time. In its regional context, however, the community finds itself on the cutting edge of intensive urbanization. The pressures emanate from all directions: north from Trenton, east from Princeton, and south along the New Jersey Turnpike. If left to evolve naturally under its present zoning, even a scattering of housing and non-residential development on but a small fraction of the community's farming areas could ruin their chance of survival. Experience amply proves that agriculture and residential development are incompatible if located side-by-side, and that agriculture can only be preserved on contiguous areas of a size sufficient to permit the economic provision of the necessary supportive services.

The ability of the nation's farms to continue to satisfy the needs of this country's own population as well as those of the ever growing numbers abroad that are dependent upon them is rendered ever more tenuous by constantly increasing product demand, diminishing lands for production, and rising fuel and transportation costs. New Jersey's highly productive farmlands are especially significant to the food-importing New York-New Jersey Metropolitan Area. A secure and cost efficient farm-to-market link will play an important role by providing the region's residents with the assurance of availability of food supplies, particularly in any unforeseen emergency that may disrupt long-distance transportation networks.

By preserving its best farmland, Cranbury can make a significant contribution to the achievement of these goals. This would be particularly appropriate since such preservation need not be at the expense of land availability for essential residential and non-residential uses due to the presence in the Township of ample expanses of vacant lands with soils that are unsuitable for agriculture or that are located in proximity to major highways, water, and sewers, and the New Jersey Turnpike Exit 8A.

The great challenge before the Township, therefore, is to make reasonable provision for the accommodation of

the inevitable demands for housing and employment while conserving as much of its farmland as possible and protecting the quality and character of the Village Historic District. This challenge can be met only if Cranbury will:

- Preserve and protect as much of its prime agricultural land as possible.
- Buffer and protect existing and future residential uses from agricultural uses.
- Protect ecologically sensitive areas, such as stream corridors, wetlands, and wooded areas.
- Provide opportunities for varied housing types, and locate higher density areas in proper relationship to major arteries and service systems.
- Develop an adequate economic and fiscal base by encouraging industrial and office land uses in areas with good access to the regional transportation network.
- Improve the roadway network to enable it to serve adequately the anticipated development.
- Preserve the setting and ambiance of the Village Historic District.

B. Planning Goals and Policies

1. Preservation of Agriculture

Goals

- Recognizing that farming is an important component of the economy of the Township, the region, and the state, and that agricultural lands are irreplaceable natural resources, preserve farmlands and encourage their continued use.

Policies

- Coordinate local agricultural land use preservation guidelines with those of the state and the county and with those of adjoining municipalities

- Preserve large agricultural areas free from the intrusion of residential and other uses.

- Assure that agricultural areas will be clearly defined by natural boundaries or land uses that are compatible with farming.

- Discourage water, sewer, and highway improvements which would increase growth pressures in agricultural areas.

- Provide opportunities for agribusiness to support local and, if appropriate, regional farming needs.

2. Residential Development

Goals

- Preserve the existing housing stock and provide the opportunity for the development of a wide variety of housing types to meet the needs of varied income and age levels, family compositions, and life styles.

Policies

- Provide an opportunity for the development of clustered detached and attached single family and multifamily housing in addition to traditional single family detached housing, to help satisfy the demands generated by the Township's expanding employment base.

- Using the Community Development Program or other available grants, continue to provide such assistance as may be needed to broaden housing affordability and to enable elderly, retired, and other moderate income homeowners to maintain their properties adequately.

3. Environmental Protection

Goals

- Maintain and protect Cranbury's rural heritage and open space.

- Protect stream valleys and wetlands.

Policies

- Conserve the wooded areas that border existing streams.

- Conserve and protect as many environmentally sensitive areas as possible by (i) requiring that new development be subject to rigorous performance standards to minimize or eliminate any potential adverse environmental effects; (ii) encouraging clustered development, wherever it would contribute to the realization of significant environmental objectives; and (iii) relating development standards and the permitted intensity of use to the carrying capacity of the soil and the objective of preserving natural features.

- Utilize modern runoff control techniques and, where needed, provide an adequate storm water system.

4. Economic Development

Goals

- Encourage development of industrial, office, research, commercial, and service uses, selected and regulated so as to preclude land use incompatibilities and in an amount that, while not disturbing the fragile residential-agricultural balance in the rest of the Township, would nevertheless increase the tax base which supports the local government and the public school system.

Policies

- Set aside areas specially suited for office-research and industrial uses by reason of accessibility to transportation.

- Use the leverage offered by Cranbury's unique existing and prospective character to attract office-research development of the highest quality, and seek to achieve such quality by means of appropriate design standards.

- Encourage commercial activities, but only in such amount as may be needed to satisfy the

commercial demands of local residents, either in well-designed shopping areas with direct access from major arteries or in the Village, in the traditional manner.

- Limit highway commercial uses serving passing traffic and regional needs as much as possible and consolidate them in contiguous commercial areas along Route 130 and other township arterials. This will improve circulation, minimize traffic hazards, and improve the aesthetic appeal of the Township by preventing strip development.

5. Circulation

Goals

- Develop a coordinated circulation system which will enable the safe and efficient movement of people and goods.

Policies

- Locate high traffic generators near existing major arterial roadways.

- Give priority to roadway and interchange improvements that will reduce the flow of traffic through the Village.

- Classify roadways according to traffic function and adjust the frontage and access regulation of abutting land uses to enhance the ability of each road to fulfill its assigned function adequately.

- Promote the construction of safe bike lanes as part of the Township's arterial road system.

6. Community Facilities/Utilities

Goals

- Ensure the provision of an adequate range of community facilities, services, and utilities to accommodate adequately existing and future township needs in a convenient and cost effective manner.

Policies

- Expand or make provision for private or public sewer and water facilities to serve areas designated for growth.

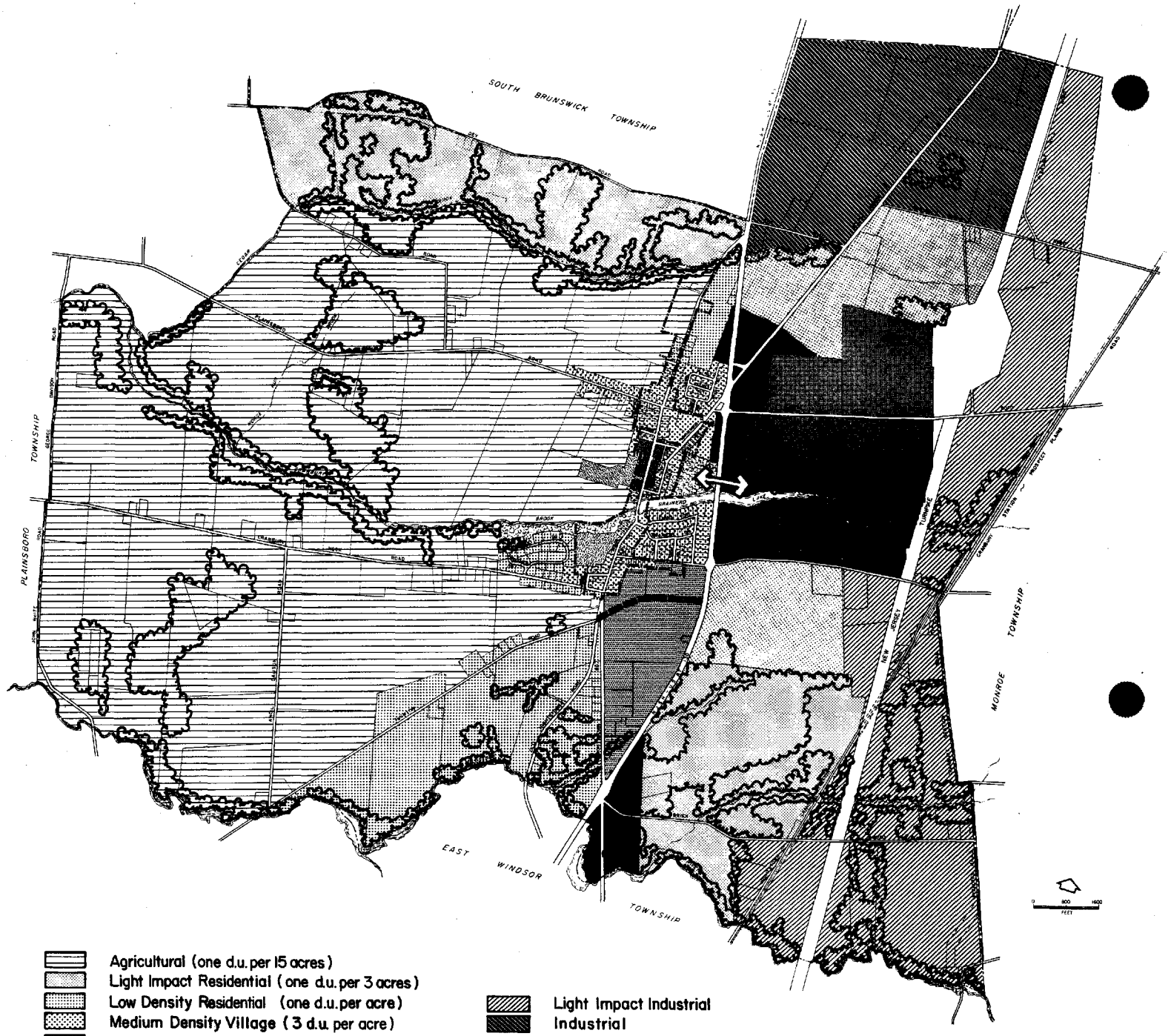
- Encourage the location of new public facilities, such as parks, where they will be within effective service radii of the Village and other developing areas.

C. Land Use Plan

The Land Use Plan shown on Plate III is based on an overall development strategy for Cranbury Township designed to help it achieve its goals in the areas of agricultural and environmental conservation, residential and economic development, circulation improvements, and the provision of needed community facilities and utilities.

The major proposed land use categories are discussed below. Plate III shows only major land use patterns and development proposals. It does not include supportive features, such as local roadways or recreation and other public facilities, which should be determined after adoption of the overall plan. The residential density standards shown represent upper limits which may not be attainable in every instance due to localized conditions. It is assumed that a greater level of detail in the determination of densities will be made in the formulation of the land development ordinance.

For many years, Cranbury's residential development had focused on the Village area. Cranbury Farms I and II (Shadow Oaks) represent the first examples of such development to have struck out into new areas along Old Trenton Road. Office research uses occur in only four locations along the New Jersey Turnpike. Compared to that in adjoining communities, the overall rate of growth for all types of development in Cranbury has been minimal. For these reasons, the need to continue existing land development trends is less compelling than it might be if a lesser proportion of the community's land were still undeveloped and if the undeveloped areas werr scattered among developed ones. Cranbury's planning policies can thus reflect public goals as well as market trends. As discussed above, the principal public goal proposed to be achieved



- Agricultural (one d.u. per 15 acres)
- Light Impact Residential (one d.u. per 3 acres)
- Low Density Residential (one d.u. per acre)
- Medium Density Village (3 d.u. per acre)
- Medium Density Planned Development (one to 3 d.u. per acre)
- High Density Planned Development (one d.u. per 2 acres to 4 d.u. per acre)
- National Historic District
- Corporate Office and Research
- Light Impact Industrial
- Industrial
- Highway Commercial
- Village Commercial
- Public / Semi-public
- Park
- Pedestrian Link
- Major Tree Area
- Master Plan Road

Land Use Plan

Plate III

CRANBURY TOWNSHIP

MIDDLESEX COUNTY, NEW JERSEY

Raymond, Parish, Pine & Weiner, Inc. Consultants Tarrytown, NY Princeton, NJ Revised June 1982 Adopted September 9, 1982

through the development and eventual implementation of this land use plan is the preservation of as much as possible of the Township's agricultural economy and historic character while making appropriate provision for anticipated growth needs.

Table III, "Proposed Uses" summarizes the areas assigned to various land uses in the Plan.

1. Agricultural Element

The Township's agricultural lands are located mainly in two areas: (a) west of the Village and south of Cedar Brook; and (b) between Route 130 and the New Jersey Turnpike. As explained below, the latter are part of an area designated in the State Development Guide Plan as a growth corridor. The lands lying to the west of the Village are remarkably cohesive and free of non-agricultural intrusions.

It is recommended, therefore, that the latter area, encompassing approximately 3,650 acres, nearly three quarters of which are in Class I and II soils, be designated in the Plan as an Agricultural Preservation Area. The area is free of water and sewer improvements. Servicing this area would be difficult because the existing sewer pumping station near Unami Park and alongside Cranbury Brook is higher in elevation than most of the surrounding agricultural conservation area.

(a) Regional Guidelines

The above recommendation is in accordance with applicable regional guidelines. Generally, the State Development Guide Plan divides Cranbury Township into two distinct areas: (1) a growth corridor alongside of, and between Route 130 and the New Jersey Turnpike, and (2) an agricultural area generally west of the Village. The Land Use Plan conforms to these guidelines. The proposed agricultural area encompasses the entire area west of the Village, north of Old Trenton Road. The smaller, equally well suited existing agricultural lands east of Route 130 are not proposed for preservation due to their proximity to major transportation routes and to the inevitability of fairly intensive development in their general

vicinity. By anticipating their development, at least in part, in the next two decades, the plan differs from the assumptions underlying their retention in agricultural use until the year 2000 in the County plan. This difference is one of the consequences of the proposed total withdrawal of the farmlands west of the Village from development and the need to make provision for the accommodation of the residential growth anticipated in the County Plan in alternate locations.

(b) Adjoining Municipalities

The proposed agricultural lands merge harmoniously with similar lands in Plainsboro and South Brunswick Township which are zoned in a compatible manner. Specifically, in Plainsboro, the area along George Davidson and John White Roads is in agricultural use with a few single family homes on large lots located near Cranbury Brook. Between Cranbury Brook and Petty Road, Cedar Brook serves as an adequate buffer between the still growing Linpro multifamily development and the adjoining lands in Cranbury which are proposed for agricultural use. The zoning in Plainsboro, which now calls for one acre minimum lots, is being revised along the same lines that are proposed for Cranbury.

In South Brunswick, the area north of Dey Road and Cedar Brook is vacant or in agricultural and orchard uses. The zoning in South Brunswick requires three acre minimum lots.

While the land across the East Windsor Township boundary is used by the East Windsor Utility Authority for the dumping of sludge, it is separated and adequately buffered from adjoining lands in Cranbury by the Millstone River. This land is zoned for agriculture requiring lots having an area of at least two acres.

(c) Adjoining Residential Development

An important element in any farmland preservation program is the proper separation of

residential and agricultural land uses. In Cranbury, it is particularly significant that this objective be achieved in the area adjoining the fairly densely settled Village. The feasibility of doing so is proven by the long-standing compatibility of uses in this area which is enhanced by the presence of certain important buffers. Between Cranbury Brook and Plainsboro-Cranbury Road, the residences are protected from farming nuisances by Wright's Roses, Hagerty Nurseries and several other nursery activities, a cemetery, and the Cranbury Elementary School.

Wynnewood and Woodview Drives form an isolated single family subdivision nestled between Cranbury Brook, Main Street and Cranbury Neck Road, which is substantially protected from any agricultural nuisances by the brook's broad flood plain.

A few small residential areas which may conflict with farm operations include the existing Cranbury Farms I, and a string of minor subdivisions along the north side of Plainsboro-Cranbury Road, and along the south side of Cranbury Neck Road.

The area south of Old Trenton Road was not included in the proposed agricultural preservation district because of development that has already occurred there. Cranbury Farms II (Shadow Oaks) has constructed 16 of the 68 units for which it has a preliminary approval. Even though this approval will expire on November 15, 1982, it may be difficult to change the course of events here since drainage improvements constructed for the first subdivision section were designed to accommodate approximately 30 units.

(d) Recommended Preservation Techniques

It is recommended that the preservation of farmlands be attempted through use of the transfer of development credits (TDC) technique, combined with an increase in the minimum lot area requirement in the preservation area to from six to fifteen acres. The impact of this lowering of the permitted base

density should be mitigated by the award to all affected owners of one development credit for each two acres of developable land. This would reflect the densities which prevail in adjoining municipalities (2-acre minimum in Monroe and East Windsor Townships and 3-acre minimum in South Brunswick). It is estimated that the value of each such credit for transfer into the proposed receiving area will substantially exceed the corresponding value of the land for agricultural purposes.

The detailed transfer of development credits mechanism will be developed as part of the land development ordinance which will be devised following official approval of the land use plan. In brief, to determine the number of credits to which he is entitled, a landowner would prepare a sketch plat meeting all basic requirements of the ordinance for a two-acre residential lot subdivision and submit it for approval by the Planning Board. The number of credits available for sale and transfer into the receiving area will equal the number of two-acre minimum lots in the approved plat. While the actual number of credits cannot be determined accurately in advance, it is not likely to exceed about 1,500.

The TDC system described above was selected following review of two other possible ways of distributing development credits:

(a) An allocation of one credit for each two acres of land to all, irrespective of the characteristics of the land involved. This system was deemed unfair and impractical since it would award the same theoretical development potential to the owner of a well-drained, fully developable farm as to that of a tract largely under water.

(b) Limiting the total number of credits so as to reflect the realistic total development capacity of the preservation area determined with the help of USDA maps and other similarly large-scale data, and their allocation on the basis

of the ratio of the assessed value of each tract to the aggregate assessed value of the entire preservation area. This method was rejected because of the imperfection of the data base and assessment technique and the many inequities which could result therefrom.

2. Residential Land Uses

The withdrawal from potential residential use of the over 3,500-acre agricultural preservation area poses a special problem for Cranbury which is subject to the Municipal Land Use Law directive that it "provide sufficient space in appropriate locations for a variety of...residential...uses ..., both public and private...in order to meet the needs of all New Jersey citizens."

The transfer of development credits (TDC) technique proposed to be used for the preservation of agricultural areas, however, has the effect of transferring, rather than eliminating, the development potential of lands to be preserved in their present use. If the opportunity is created for such transfer into one or more districts which, by permitting a variety of densities and housing types, would broaden the Township's housing supply, it would appear that any possible statutory requirements will be adequately met.

The proposed residential land use plan also conforms to the Municipal Land Use Law directive that the areas intended for each type of use be selected "according to their respective environmental requirements." It respects the need to protect and enhance the character of existing, already developed areas and the difficulty, if not impossibility, of changing direction in areas that are committed to a given course of action by virtue of prior approvals by the Township.

a. Light Impact Residential Classification (one du/3 acres)

Two parts of Cranbury Township are recommended to be placed in this classification. These are:

(a) The largely vacant and wooded 560-acre area located generally between Route 130 and the Pennsylvania Railroad, from a line approximately 2000 feet south of Station Road to the East Windsor line, lacks both public sewers and public water. It contains a handful of existing older residences and some small scale farming activities.

(b) The largely vacant and partially wooded area bounded by Cedar Brook and Dey Road.

The high ground water table in these areas makes them generally unsuitable for intensive development. Since some discrete portions are undoubtedly useable, it is proposed that these areas be given a "light impact" residential classification limiting residential development to three-acre minimum lots and permitting single family detached residences, along with agricultural, recreation, and conservation uses. Where it can be shown that no environmentally adverse impacts would result, residential development in these areas could be clustered on lots with a minimum of one acre. This option would be granted as a conditional use. Street improvement standards in both areas should be adjusted to reflect their future rural character.

b. Low Density Residential Classification (one du/2 acres to 1 du/acre)

Vacant and developed residential areas south of Old Trenton Road, as well as a minor enclave north of the Village between Main Street and Route 130, are included in this land use category. Some of these agricultural areas have preliminary approvals for one-acre subdivisions. Uses in these areas are to be limited essentially to single family detached residences and supportive community facilities which enhance a residential environment. The basic permitted density would require 2 acre lots, with permission to develop on one acre lots being achievable only upon provision of either sewers or water.

c. Medium Density Village (3du/acre)

In the Village area, which includes the Historic District, it is proposed that its traditional density be retained. When the zoning ordinance is reviewed, the desirability of including architectural controls that would maintain the integrity of the Historic District should be thoroughly investigated.

d. Medium Density Planned Development (1 du/2 acres to 3 du/acre)

The area generally located between Main Street and Route 130 south of the Village is proposed for development at either (1) a density of one dwelling unit per two acres as of right, or (2) three dwelling units per acre, with wide latitude given as to housing types. Permission to develop to the higher density would be contingent upon the purchase of transfer credits from the agricultural preservation area (see Section e., High Density Planned Development, below).

It should be noted that running through this area is a proposed extension of Old Trenton Road to Route 130. A schematic alignment for this road is shown on the Land Use Plan map, and a more precise alignment will be developed as part of the Circulation Element of the Master Plan. In the area north of this road, the full yield of 3 dwellings per acre should be realizable subject to the condition that, fronting on Station Road, the only form of development permitted would be single family detached houses on lots with a minimum area of one acre. In approving site plans for developments at the higher density in the area north of the Master Plan road, the Planning Board should endeavor to assure that a generous setback will be provided from the rear property line of all residences located in the adjoining Historic District. A minimum lot area requirement of 10 acres is recommended to assure the possibility of achieving adequate useable open spaces and a suitable neighborhood design.

e. High Density Planned Development (1 du/two acres to 4 du/acre)

The area east of the Village, between Route 130 and the New Jersey Turnpike, presents the best opportunity for the expansion of the built-up residential component of the Township. It is connected to the heart of the Village by means of Half Acre and Station Roads, and it contains lands which, except for the temporary absence of services, are suitable for higher density development. To make such development possible, the Township's facilities plan already proposes that the 24-inch sewer line which presently dead ends at Scott Avenue be extended eastward. Pending such extension, it is proposed that the density in this area be held to one du/2 acres, but that, following the installation of sewers, the affected land owners be offered the option of increasing the permitted density to a maximum of 4 du/acre upon the purchase of agricultural credits.

To encourage at least some of the housing that will be provided in this area to be affordable by moderate income families, it is proposed that the maximum density achievable as of right be 3 du/acre, with the fourth unit being available only if provided in the form of "least cost" housing, as this term may be defined in the zoning ordinance. The building types to be permitted could include the full range, from single family detached to town houses and apartments in fee simple, condominium, or cooperative ownership, or for rental occupancy. Building heights should be appropriately limited to achieve the desired community character. The mix of housing types should be regulated to assure that the housing styles represented in the area in substantial quantities will include attached single-family homes, town house condominiums and/or cooperatives, and rental units.

It is recommended that the minimum tract requirement in this area be 50 acres. To integrate the new development with the area west of Route 130 and to reduce the hazard

which the need to cross that artery would present to the residents, it is proposed that the two pedestrian overpasses into the Village on either side of the lake shown on the Land Use Plan be required as an off-site improvement.

A portion of this area adjoins the New Jersey Turnpike and may, therefore, be less than totally desirable for residential uses. Providing the deep set backs that would offer the necessary protection from the noise generated by that artery would use a great deal of open space that should preferably be located in the heart of the residential area. A suitable alternative use in this highway-impacted strip, therefore, might be for corporate offices and research establishments, in which case an equivalent amount of land now shown as suitable for offices would have to be allocated for high density residential use.

3. Non-Residential Land Uses

The Township's unique location in the Central New Jersey region, roughly half-way between Trenton and New Brunswick, and the major regional accesses afforded by Route 130 and New Jersey Turnpike Exit 8A, have already brought here the prominent research and development centers of Carter Wallace and General Foods. In this plan, most of the area lying between Route 130 and the Turnpike corridor, which is currently zoned for industrial uses, is proposed to continue to be reserved for major non-residential development. The plan would subdivide this area into three functional classifications, as detailed below.

a. Corporate Office and Research

The areas east of Route 130 and closest to the existing and proposed higher density residential areas of the Township are proposed for corporate offices and research establishments at the highest achievable development standards. It is believed that this area could attract high quality corporate office users interested in high visibility, corporate image, and long-term stability

of property values. Research uses within this zone are intended to be similar to the General Foods and Carter Wallace facilities and therefore be fully compatible with other corporate offices and adjoining residential developments.

The minimum required lot area should be 10 acres, except that, if the lot is a part of a campus-like development on at least 50 acres under unified management, the lot area might be reduced to three acres. Direct access to individual lots from Route 130 or South River Road should be discouraged in favor of access from a main collector road.

b. Light Impact Industrial

The use of this classification is almost entirely limited to the area located east of the New Jersey Turnpike which is also currently zoned for industry. All of Cranbury's existing major office-research corporations are located within this zone. Portions of this area, particularly south of Station Road, suffer from some natural environmental constraints which would tend to restrict its development. Further, Brick Yard Road which provides access to this portion of the area has limited ability to serve high traffic volumes.

The permitted uses should include a wide range of light industrial and manufacturing activities, perhaps discouraging those which require high bulk raw materials for manufacturing or generate high truck traffic volumes. The minimum lot area should be ten acres for industrial uses and three acres for office-research buildings.

c. Industrial

The area located east of Route 130 and north of Dey and Prospect Plains Roads adjoins an area zoned for intensive industrial use in South Brunswick. It is proposed that this area, which is also zoned for industrial uses at present, be set aside for a range of industrial wider uses than that permitted in

any other area in the Township, but excluding any uses whose presence would be environmentally unacceptable.

The minimum required lot area should be 10 acres for industrial uses and three acres for office-research buildings. As was proposed above for the corporate office and research area, direct access to properties from Route 130 or South River Road should be discouraged.

d. Commercial Land Uses

The Township's commercial areas serves two functions: they provide convenient, essential services to its residents, and they contribute to its tax base.

An underlying principle of the commercial land use plan is the proper grouping of various commercial uses by primary functions and land use requirements. New commercial development should be consolidated into compact areas so that retail strength will not be diluted by random spread. Concentration also facilitates the making of proper provisions for loading and off-street parking, which, by eliminating frequent curb cuts and curb parking, helps to reduce traffic frictions on major streets.

There are two types of commercial land uses proposed by this Plan. The Plan continues the commercial uses in the Village and provides for limited highway commercial use expansion along Route 130. Major retail or large commercial shopping center development is not envisioned by this Plan as such regional shopping needs are adequately serviced by the shopping malls located in East Windsor and Lawrenceville.

The designated commercial land use areas within the Township are as follows:

(1) Village Commercial. These would be a small scale retail convenience center oriented in use and sized to service the convenience needs of the immediately

surrounding Village area and the proposed High Density Planned Development Area to the east of Route 130.

The uses permitted under the existing zoning regulations would need to be re-examined with a view toward scaling down their intensity and bulk to make them more consistent with the character of the Village.

(2) Highway Commercial. These areas would provide the full range of retail and service activities required to serve the Township's local needs. The area proposed for Highway Commercial uses is intended to include only existing commercial uses on Route 130 and those adjacent vacant lands which are deemed unsuitable for any other uses by reason of the impact thereon of the existing uses. This narrow delineation is specifically intended to prevent the kind of strip commercial development that has marred so many principal state highway frontages in other communities and is also an expression of the Township's policy to maintain the vitality of the commercial uses in the Village.

(3) The Village Historic District. Cranbury's Historic District defines the Township's culturally and architecturally significant area. Almost as important, it provides a prominent physical identity not commonly found in other municipalities. Because of this, it is important that the Township sensitively plan adjoining areas and carefully regulate the intensity of development within the Village area. Once the Land Use Plan is adopted and implemented through the land development ordinance, appropriate architectural guidelines and/or ordinances to protect the integrity of the Historic District could be developed as a Master Plan supplement.

4. Land Use Plan Impact Evaluation

Set forth below is a selective evaluation of the principal impacts of the proposed land use plan.

(a) Housing--Jobs Balance

A basic purpose of this Plan has been to create a reasonable balance between the areas zoned for residential and non-residential uses, and to create adequate opportunities for the development of a variety of housing types to serve the anticipated needs.

The estimated maximum number of dwelling units which could be accommodated when all land set aside for residential use is fully developed ranges approximately between 2,500-3,000 (depending upon the ultimate use of the strip along the Turnpike). To this would be added the roughly 750 existing units, for a total of 3, 250 to 3,750. At an average household size of 2.5, this number of units could house some 8,000 to 9,500 persons. This equals approximately 1-3/4 to 2 times the 4,600-person population projection for Cranbury for the year 2000 made by the Middlesex County Planning Board. The capacity provided in the plan is thus ample for all foreseeable growth needs.

The upper limit of the proposed additional capacity of between 2,500 and 3,000 dwelling units is slightly less than the estimated 3,200-unit capacity of all residentially-zoned lands under the existing zoning ordinance.

The projected capacity will only be reached if the developers of vacant lands in the Medium and High Density Planned Development Areas will opt to use the maximum permitted density. The probability that this will happen would be greatly enhanced if the zoning regulations in these areas permitted development at either the lowest density (one unit/2 acres) or at the maximum density (3/acre or 4/acre with one in four units of the "least cost" type), and, in the absence of compelling reasons to the contrary, prohibited the

Table III

RESIDENTIAL LAND CAPACITIES
Cranbury Township, New Jersey

Residential Land Use Categories	Vacant Developable Acres	Housing Density	New Housing Capacity (du)
Light Impact Residential	1,120	1 du/3 acres	373
Low Density Residential (R-170)	380	1 du/2 acres to 1 du/acre (no clustering permitted)	150 to 285
Medium Density Village (R-100)	10	3 du/acre	25
Medium Density Planned Development	135	1 du/2 acres to 3 du/acre	70 to 405*
High Density Planned Development	530	1 du/2 acres to 3-4 du/acre*	270 to 1590*-2120**
Total	2,275		735 to 2,620-3,155***

*The higher number is achievable only through transfer of development credits from the Agricultural Preservation Area.

**This number is achievable through transfer of credits and only if 25% of the units are provided in the form of least cost housing.

***The maximum would be reduced by 20% of the amount contributed by the High Density Planned Development area, or some 320 to 420 units, if the strip along the Turnpike is set aside for corporate office use and if no compensating land is added to the High Density Planned Development area.

Table IV

ESTIMATED EMPLOYMENT CAPACITY OF NON-RESIDENTIAL AREAS

Non Residential Uses	Vacant Developable Acres	Employees Per Gross Acre	Potential Employees at Full Development
Corporate Office and Research	520	3-8	1,560-4,160
Light Impact Industrial	1,240	1-3	1,240-3,720
Industrial	430	1-3	430-1,290
Total	2,190*		3,230-9,170*

*The area devoted to corporate offices may be increased by approximately 100 acres if the strip in the High Density Planned Development area along the Turnpike were devoted to such use with no compensating reduction of land set aside for office uses elsewhere. This would increase the employment potential by 300-800 jobs.

use of any intermediate density. In any event, it is important to note that, should these two areas be developed at less than the maximum permitted density, there would be no market for all the development credits generated in the Agricultural Preservation Area. Were this to occur, the Township would have to revise the Plan to make provision for the transfer of additional credits into other areas.

Based on the county-wide average of 1.5 persons per household in the employed labor force, the ultimate number of existing and possible dwelling units of between 3,250 and 3,750 will accommodate a labor force of approximately between 4,875 and 5,625. Including the approximately 2,200 existing jobs in the Township, the number of jobs that may exist in Cranbury when all non-residential land is fully developed will range between 5,450 and 11,370. The amount of housing for which provision is made in the Plan is quite sufficient to satisfy <u>all</u> the locally-generated

employment-connected needs at the bottom of this range. Should the number of people employed in Cranbury approach nearer to the top of the range, the Plan assumes that, in accordance with the Mount Laurel doctrine which does not require each community to fully provide for all its needs, the necessary housing will be available elsewhere in the region where such important public goals as farmland and historic preservation are not present. Should the statutorily required future reviews of the Plan show the emergence of any serious imbalance between jobs and housing, the Township will have every opportunity to adjust land allocations and densities accordingly.

5. Compatibility with Local and County Master Plans and State Development Guide Plan

As explained in the body of the Plan, every effort was made to achieve use compatibility across municipal boundaries; a harmonious relationship between the planning objectives underlying the proposed land use distribution in Cranbury and the corresponding master plan objectives in the municipalities that are contiguous thereto; and full conformity with the broad guidelines of the County Master Plan and the State Development Guide Plan.

6. Implementing the Land Use Plan

The implementation of this Plan requires its adoption by the Planning Board, followed by the preparation also by the Planning Board, of a comprehensive Land Development ordinance, and its adoption by the Township Committee.